The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Gases in Steel.

A short time since, as some of our readers will remember, we submitted the views of Doctor Müller and M. Pourcel on the subject of gases in steel ingots, and now present the following communication, sent to the *Ironmonger*, of London, England, by Mr. John Parry, of Ebbw Vale, bearing upon the same topic:

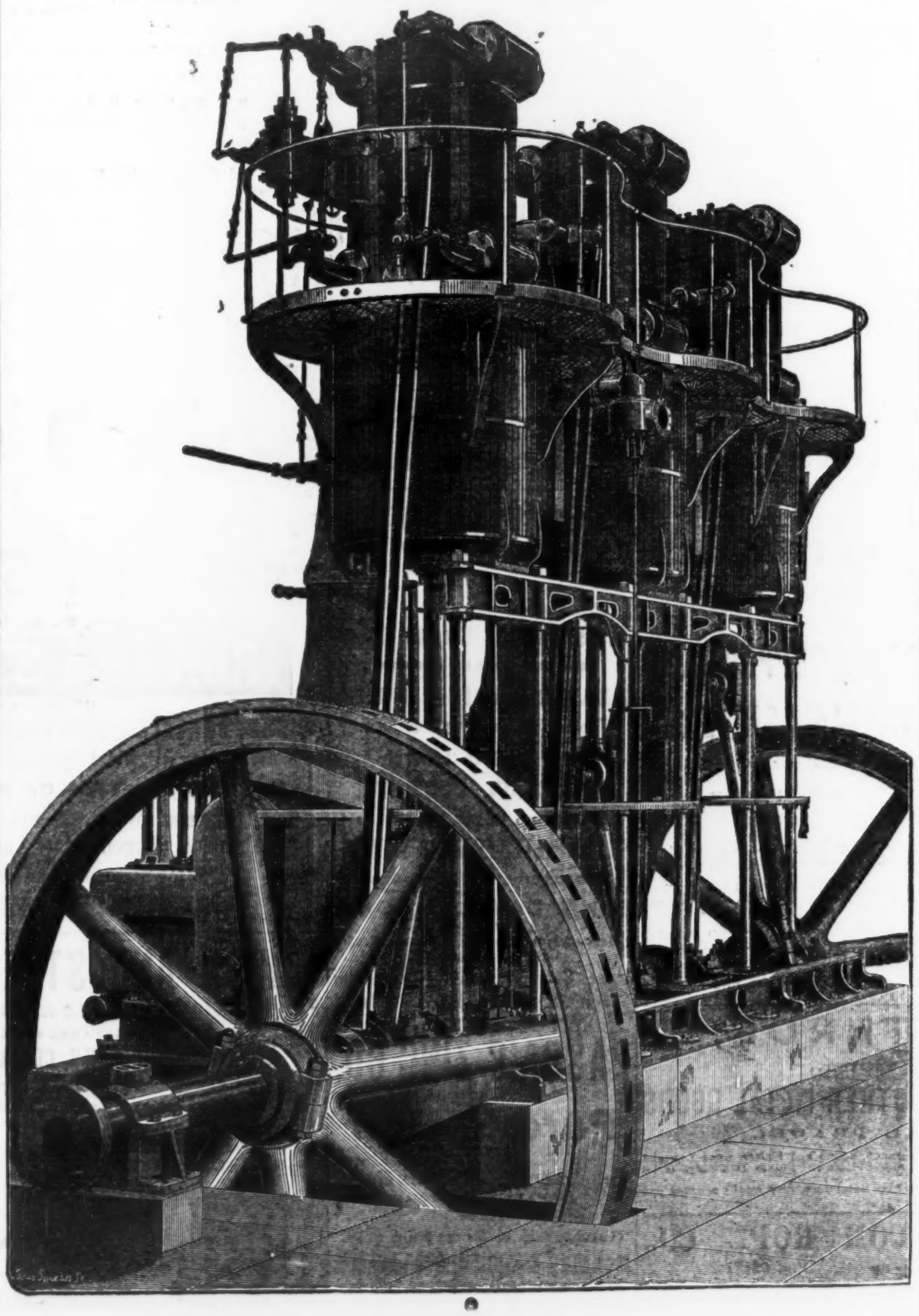
I have read with much interest the very interesting paper by Doctor Müller on the gases contained in steel, together with M. Pourcel's criticisms thereon. Doctor Müller, in stating that Bessemer steel, although containing a high percentage of silicon, is yet full of pores, quotes as a fact that which is directly opposed to my own experience, and also, I think, to that of many chemists and metallurgists. M. Pourcel, in attributing the pores, &c., to the incomplete mixture of the spiegel and the decarbonized iron, affords the only solution of the difficulty. I have long noted the fact that the addition of silicious spiegeleisen (containing 20 per cent. manganese, 2 per cent. silicon) is attended with less ebullition than when ordinary spiegel, containing only 0.1 to 0.2 per cent. silicon, is used, the steel in both instances containing only 0.04 per cent. silicon. I have consequently never objected to the use of spiegel containing not more than 2 per cent. silicon, and am of opinion that when we have the three elements—silicon, carbon and manganese—together in the bath, silicon is preferentially oxidized; in other words, it has a greater affinity for the oxygen contained in the bath of blown metal, thus forming slag, and leaving a slight excess of carbon in the steel. With spiegel of normal composition the oxygen is eliminated in the form of carbonic oxide, thus causing violent ebullition and tending to the formation of blowholes.

If I understand Doctor Müller aright, there is no reaction as described; on the contrary, the enormous volume of gases liberated is merely the elimination of previously absorbed gas. Obviously this requires explanation. I have found that carbon reacts on oxide of iron at a temperature of about 800°, forming carbonic oxide together with a little carbonic acid (*Journal of Iron and Steel Institute*, 1872). At a higher test the carbonic oxide is very rapidly evolved. It seems the majority of chemists and steel casters must ignore their previous teaching and experience ere they can agree with Doctor Müller as regards the non-reaction of carbon and oxygen. The assertion that silicon participates in no way in the oxidation process cannot be received without qualification. From my own practice and experience, I can confirm M. Poucel's analyses. In ordinary Bessemer working, on adding silicious spiegel, the ordinary violent ebullition attended with evolution of carbonic oxide does not occur. The difference is so marked that the behavior of the bath on the addition of spiegel determines that a silicious spiegel has been added, or that the cast has been overblown. Oxygen, in the first instance, is eliminated in the slag; in the second place, the usual quantity of oxygen dissolved in the bath is absent. That silicon is retained during the blow, as with phosphorus, in the Thomas process, is disproved by the analyses of Mr. Snelus, showing that silicon is more rapidly oxidized than carbon. We must, therefore, accept M. Pourcel's explanation, or infer that Doctor Müller's observations are applicable only to metal of abnormal composition, such as no English steel manufacturer uses. It seems probable that the quantity of gas obtained by the method of drilling represents only a fraction of the total amount in the metal, and the method is further open to the objection that a portion may be from the water or oil under which the steel is being drilled. I have failed to obtain information on this point, but I believe Mr. E. W. Richards has said that a portion of the hydrogen was evolved from the water used.

No doubt a careful chemist like Doctor Müller has made satisfactory experiments, and has proved that his analyses are free from the above-mentioned probable source of error. His analyses are valuable as indicating relatively the quantity of free—or, more correctly, unencumbered—gas locked up in the metal in the cavities or blow-holes, thereby mechanically weakening the steel, but, it must be conceded, not affecting its chemical composition. Neither of these gentlemen have touched on this matter; their attention has apparently been confined to the confessedly important problem of producing solid, and consequently good, steel. Whether the quality of the steel is affected by the large quantity I have proved to be in solution irrespective of the H (which may or may not be in the blow-holes, &c.) as yet remains undecided. It is however, very probable that steel saturated with hydrogen must resist oxidation better than steel containing little or none. My experiments are pretty well known; the recapitulation of them is, however, necessary to a fuller elucidation of my views. You must pardon me if I again quote them as briefly as possible:

1. The quantities of HCO, &c,, are gently in excess of those given by Doctor Müller. 2. Carbonic oxide is not absorbed by heated steel. 3. Doubtful results, probably not absorbed. 4. Hydrogen readily absorbed. Absorption greater at high than low heat; highest temperature applied not above fusing point of gray iron. 5. Steel heated in vaporized zinc, cadmium, bismuth, &c.; also sulphur, phosphorus and arsenic absorb these elements—sulphur very rapidly absorbed in ore; for instance, iron absorbed 6.75 per cent. sulphur. 6. Zinc, cadmium, &c., as hydrogen, is evolved on reheating steel; sulphur, phosphorus and arsenic are retained. I failed to obtain the slightest indication of sulphur in the spectrum of the vapor evolved from the metal containing 6.75 sulphur. I have recently found that all iron and steels, when heated in vacuo, evolve copper as readily as hydrogen; manganese also volatilized, but with greater difficulty.

The above elements are easily recognized in the spectrum of the vapor evolved in heating the metal in vacuo. Messrs. Müller and Pourcel appear to treat the question of the gases in steel as a general one—that steel absorbs gas much as water does, and that it is evolved under like conditions. My experiments obviously do not support their views; they indicate that iron or steel combine with the elements as follows: 1. Alloys are formed with the metals, hydrogen, zinc, &c.; these are decomposed by heat; the lighter and more volatile elements are partially eliminated at a rate dependent on the time and temperature applied. 2. Chemical combinations are formed with sulphur, phosphorus and arsenic, similar to iron oxide. These may be termed, indifferently, sulphurized, phosphorized or oxidized iron. 3. Carbonic oxide has no affinity for iron and steel; no alloys or chemical combination are formed as above defined. We have for consideration: Do alloys, Class I, affect the quality of iron or steel? In the present state of our knowledge no certain reply can be given. Carbonic oxide affects steel mechanically only, as before described, unless we admit, with Deville, that the gas exists in the pores of the metals; he imagines an intermolecular porosity, finer even than that in the finest earthenware.



NEW ENGINES CONSTRUCTED FOR THE ENGLISH MINT.

Absurdities of Patent Specifications.

It is a fiction of our patent laws that a patent must contain such a description of the thing patented as to enable one skilled in the art to produce the article. When one turns to the *Official Gazette* of the Patent Office and looks over the specifications and claims of patents, he comes to the conclusion that one much more needs to be skilled in the slang of patent agents than in the arts. The most extraordinary combination of words and sentences is found, and it would seem that the principal aim of many patent lawyers and patent agents is to conceal the ideas by the use of a slang which shall be unintelligible. In a recent number of the *Gazette*, we find a patent in which the words "substantially as set forth" occur three times in one single short sentence, yet the "setting forth," so far as we could see, had not been done in any portion of the patent or its claim. The "herein described" and "hereinbefore mentioned" and similar imitations of legal phrases were introduced without rhyme or reason. We also found such absurdities as "imperforate" instead of impervious, and "backwardly projecting," "bi-furcate," "upwardly projecting" and other similar terms, which were used with a frequency which does not speak well for the clearness of thought of the writers. There is also a growing tendency to introduce hyphens between words that cannot be compounded with any show of reason. A single number of the *Gazette* has given all our illustrations; could we go through it for a month or two, much more would be developed. The result of this tendency will be that a patent will be anything but what its name denotes, and we apprehend that a large proportion of those granted within the last two or three years will be utterly valueless until the courts have decided what the jargon employed really means in plain English. If this rubbish did convey a clear meaning to any one there might be some excuse for it and it would be tolerated, but it conveys ideas neither to examiner, patentee nor public. We must not, however, be understood as saying that these criticisms apply to all patents. Occasionally one is met with where the clearness and accuracy of the language, both from the literary and mechanical standpoint, leave nothing to be desired. We call to mind some that are models of mechanical description. Such patents are their own defense. They are not spring-traps laid with the hope of catching some unwary infringer by means of legal juggling.

Future Fields of Enterprise.

Now that we have direct steam communication with Brazil by an American line, some among our mercantile classes who are inclined to foster an export trade may anticipate too much. True, the field is interesting, but it is beset by many embarrassments. To say nothing of the advantages which European competitors have already acquired from years of experience and possession, the paucity of the population and the very primitive habits of the large majority must come into the consideration. Alexander Del Mar, an intelligent mining engineer, who has enjoyed opportunities for extensive observation in that country, is satisfied that the total population does not exceed 5,000,000, although it is put down in the official papers at 9,500,000. In support of this assertion, Mr. Del Mar says further: "The population of Rio Janeiro is said to be 350,000, whereas it is a much smaller city than San Francisco. The population of Campanha, the principal town of Minas Garaes, is claimed to be 5000. It actually has about 500 houses and 2500 inhabitants. San Gonzalo, another town in Minas Gareas, is put down at 3000, whereas it contains not to exceed 1000. In the total population there are included 2,000,000 Indians. The Indians have never been numbered, and it is not known for a certainty that even 500,000 are in existence. None are to be seen by the traveler, and such as there are are hidden in the fastnesses of the Andes."

One consequence of this anomalous condition of population in Brazil is that the revenues of the State have to be raised entirely from commercial incidents, such as the importation, exportation and provincial passage of merchandise (*octroi* duties), and from paper money and stamps, the latter having to be fixed to every conceivable sort of instrument, such as contracts, receipts, bills of exchange, checks, &c. There being few roads, traveling is mostly done on muleback at the rate of 20 miles a day. Of workshops there are almost none beyond the seaboard cities. Each man builds his own house, and procures from the coast such things as he is unable to make himself. The fireplace is built of sun-burnt brick, the smoke escaping through the thatch, and in the absence of stoves the ordinary food of the Brazilian is of the the simplest description. The Emperor Dom Pedro, as every American knows, is an intelligent monarch, actuated by the noblest impulses, but is able to command only a few of those resources which are needed for the development of the splendid dominion comprising his jurisdiction. Even with the aid of immigration, which the Government is doing so much to encourage, and further assisted by foreign capital and foreign enterprise, it will be vain to expect a speedy realization of the brilliant hopes which many are prone to indulge. We cannot doubt, however, that both Brazil and Mexico, as well as parts of Central America, must eventually take a much higher rank among commercial States.

New Engines for the English Mint.

The English Mint, though long by tradition the most wonderful institution of the kind in the world, has at last outgrown its antiquated machinery, and it became necessary not only to renew a considerable portion of it, but also to supply new engines. Of all the new machinery which has been put in, the engines by Messrs. Maudslay, Sons & Field, London, are the most interesting. As shown in our cut, Fig. 1, they are operated by a modified Corliss gear, the details of which we give in the outline diagrams. The engines consist of three separate compound tandem engines with inverted cylinders, and can be worked singly or coupled together. The middle engine is only used in case one of the other engines is stopped, its crank at other times being replaced by an intermediate shaft, which is straight. The governor is of the Porter type. The cylinders, as shown in Fig. 2, are cast with separate liners, the casing forming a steam jacket. The valves themselves are located in the jacket, and are of the Corliss type, with variations under the Musgrave patents. In Fig. 3, P represents the high-pressure cylinder, which is set directly on top of the low-pressure cylinder. B is the eccentric connecting-rod with rock-arm D. This arm works the rods C and C′, which give motion to the steam valves in the cases M and M. The length of these connecting-rods is adjusted, as is usual, by the screws F and F. L, L and I in Fig. 3, and L′′ in Fig. 4, work the exhaust-valves in the cases E. The rods C and C′ are cut away so as to catch alternately on a trip-piece. The pin is controlled by the levers R and R, which are attached by the rod B to the governor. This rod and its connections are adjustable by the nuts F and F′. The movement of the valve is effected through the medium of a lever, as shown, against the resistance of springs in the air-cylinder A. Consequently, the higher these rods R and R′ are held by the governor, the sooner will the edge of the short rods C and C′ pass the trip-piece in the central part of the pin. The whole arrangement seems to have been worked out with an idea of following the Corliss practice as closely as possible, and at the same time introduce certain variations. The low-pressure cylinders are worked on an altogether different plan, having double-ported slide-valves worked by a separate eccentric. The air pumps are

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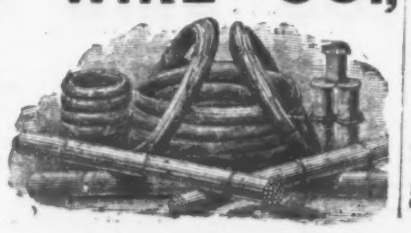

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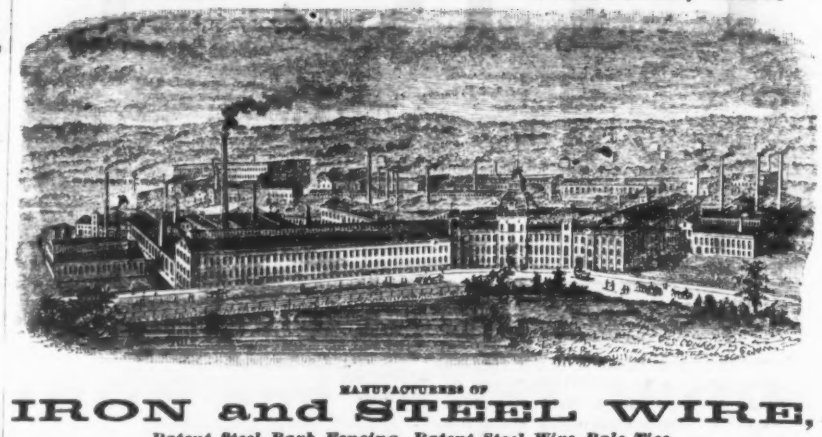

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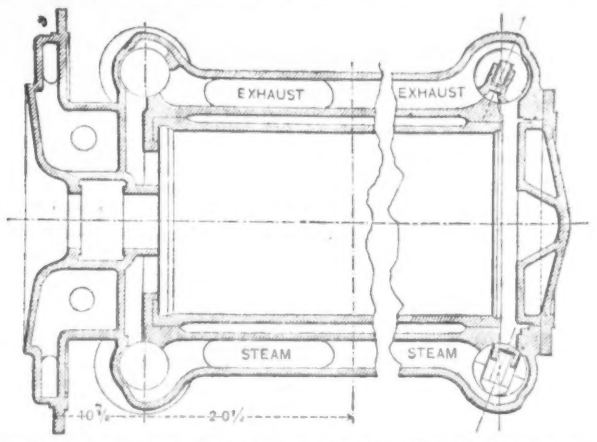
single-acting and worked from the cross-head, and are placed to the rear of the cast-iron standards which form the condensers. Their links and beams can be partly seen through the fly-wheel in Fig. 1.

To overcome the difficulty sometimes met in keeping the gland between the cylinders tight, a door is placed so that this gland can be easily reached. The packing consists of two rectangular blocks of metal, each of them being cut out on one side to cover half the rod. The fly-wheels are 14 feet in diameter and weigh 10 tons, and are on the first length of shafting which is continued into the rolling mill. The notches in the fly-wheel are for the purpose of turning the engine over without steam, by means of a claw and hydraulic jack. Their forms are such that the claw falls out of gear if the engines start ahead. The bars rolled in the rolling mills are exceedingly short, and hence the work thrown upon the engine is very variable, but the speed is reported as being completely under control of the governor and cut-off, no variation to any extent being visible when bars are put into all the mills simultaneously. Some of the machinery which was retained when the Mint was remodeled is reported to be in good condition. One machine especially is spoken of which was made by Henry Maudslay, and bears the date of 1816.



New Engines for the English Mint.—Fig. 2.—Section through Cylinder and Valves.

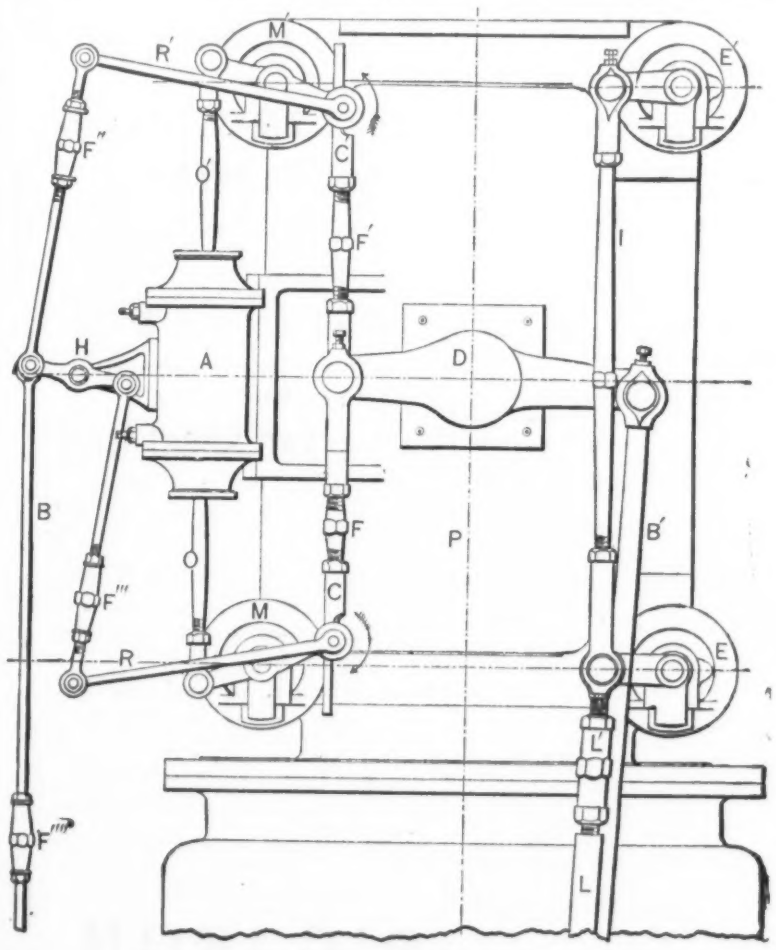


Fig. 3.—The High-Pressure Cylinder and Valve Gear.

In experiments made by Prof. A. Wagner with some metals and alloys and water in a certain condition some curious results were obtained. In water containing saltpeter and air free from carbonic acid, lead and zinc were most violently attacked, tin and Britannia metal only a little, and copper, brass and German silver not at all.

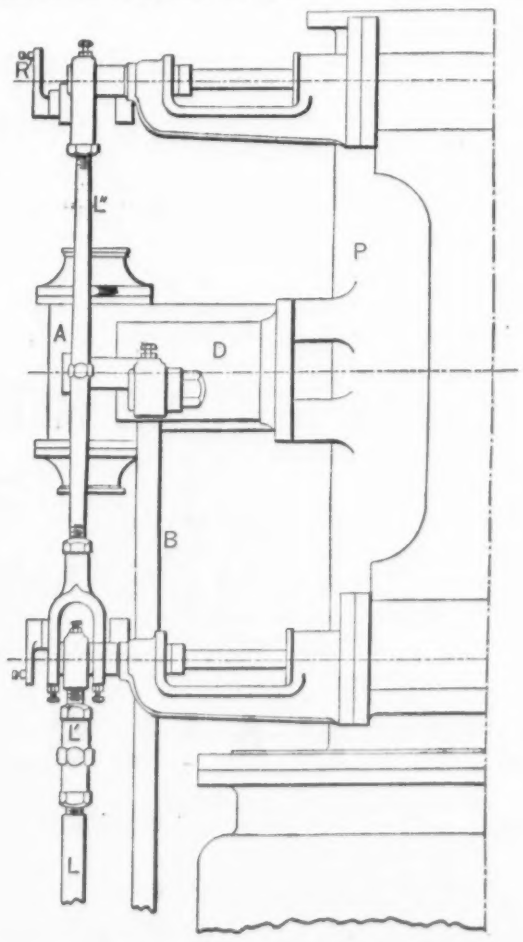


Fig. 4.—Side View of Valve Gear.

NEW PUBLICATIONS.

THE THEORY OF THE GAS ENGINE. By Dugald Clerk. Size, 7¾ x 6 inches; 164 pages. Price, 50 cents. Published by D. Van Nostrand.

The progress which within recent years has been made in connection with the gas engine has attracted the attention of the engineering profession in no little degree, and any valuable addition to the literature of the subject cannot fail to be of interest. Among recent contributions we would mention the above work, which was received a short time since, and which, as an inspection shows, is a reproduction of a paper read by Mr. Dugald Clerk at one of the meetings of the British Institution of Civil Engineeers. In one of our last year's issues we submitted an abstract of the paper, and some of our readers probably recall the fact that the information conveyed within the narrow limits to which we were confined was of considerable interest. Being merely an abstract, however, an appreciable portion of the matter was necessarily omitted, and those who are more deeply interested in the subject will undoubtedly find the little book here considered to give further information of an equally interesting character. The paper embraces a number of diagrams obtained from different types of gas engines, such as the Lenvir, Otto and Clerk engines, the Brayton petroleum engine and several others. The paper itself covers some 82 pages of the book, the remaining portion being devoted to its discussion by several members of the Institution. In this portion also the reader will find information of considerable value, a number of highly interesting diagrams being submitted, together with the views of different members.

AMERICAN FOUNDRY PRACTICE. By Thomas D. West. Size, 5 x 7½ inches; 291 pages. Price, $1.50. Published by John Wiley & Sons.

A short time since, we received an interesting work bearing the above title, which, we think, will meet with a very favorable reception among the class of mechanics for whom it is specially intended. The author, Mr., Thomas D. West, is well known as a practical molder, and his remarks, which convey a large amount of useful information bearing upon the subject considered, are arranged in an attractive and very pleasing form, the author having endeavored to select such matter as would illustrate the varied workings of different castings, and to offer problems for thought and study to practical molders. The book being intended for practical men, the remarks made are of such a nature as to render everything connected with foundry practice plain and practical, and in his endeavors the author has been eminently successful. The book, which embraces some 291 pages, is provided with numerous illustrations from drawings made by the author, and these will be found to lend considerable aid in more thoroughly comprehending the various operations. Some interesting comments are submitted on the molder and his trade, and sound advice is given to such who propose to follow the profession.

Green-sand molding is treated of at some length, and the various operations gone through in molding and casting fly-wheels, large and small pulleys, bevel and spur wheels, &c., are described. Attention is also given to the proper care of iron and wooden flasks, skimming and flow-off gates, and to "one hundred items that apprentices should know and remember," and these, we would mention, are indeed worth remembering, containing, as they do, valuable practical information in a condensed form. Interesting sections are devoted to the building and firing of large ovens, ovens for drying small cores, casting anvil blocks, molding rolls and making roll flasks, and a host of other subjects too numerous to receive mention here. Under the head of "Manipulation of Iron Castings," the author dwells upon the various difficulties encountered in melting and casting the iron, and the methods to be pursued in order to successfully overcome them, and foundry managers, by referring to these pages, will undoubtedly find assistance of such a nature as will materially diminish their labors and remove to some extent the dangers of failure. The concluding pages of the book are devoted to valuable notes and receipts relating to blacking, loam, dry-sand and core-sand mixtures, green-sand facings, cleaning castings, and tables of weights of castings. The melting of iron, already referred to, is a subject which will be found quite condensed and simple in its treatment, although it is of great importance, and from the ample illustrated workings of the foundry cupola and its management many valuable and practical ideas will undoubtedly be derived.

All the matter contained in the book is the result of many years' experience and practice on the part of the author, not only as a workman in, but also as a manager of, foundries. Mr. West, having traveled over and been employed in different sections of the country, has had an opportunity of obtaining a varied practical knowledge of American foundry practice, and this he has reproduced in the work here considered. The field for thought and study in foundry practice, as the author very appropriately states, is very large, and we do not doubt that considerable benefit will be derived from a perusal of this book by the practical molders of America.

STRENGTH OF WROUGHT IRON BRIDGE MEMBERS. By S. W. Robinson. Size, 3¾ x 6 inches; 175 pages. Price, 50 cents. Published by D. Van Nostrand.

Those of our readers who are interested in the subject treated of in this little work have undoubtedly often found that investigations concerning the strength of bridge members occasion the use of formulæ which are not always readily accessible, and which in many cases are obtained only after diligent perusal of the various text-books on the subject. The author, in making examinations of existing bridges for strength and trustworthiness, has experienced this difficulty, and, in order to avoid a repetition on the part of others of the large amount of labor entailed in procuring these formulæ, has published the results obtained by him in the work here considered. The formulæ referred to are such as take account of longitudinal as well as simultaneously acting transverse loads, while the beam is itself held

in various ways. The book is divided into two parts, the first of which treats of the general theory of beams, while the second part contains practical formulæ for beams, struts, columns and semi-columns, and an extended comparison of various formulæ, with experiments. To make this comparison more satisfactory to practical men, the breaking load of 33 columns of wrought iron, boxed and open built, such as used in bridges, has been computed and placed opposite the breaking load formed by actual test in a testing machine. The results thus obtained are arranged in a table, which contains also the calculated breaking load as found from the Rankine formula, the Bouscaren-Keystone formula and other sources, and which, we think, will be found both interesting and valuable. The investigations leading to the results given in the work were instanced by the Ohio State Railway Inspection Service, in which service results were sought, in critical cases, that were worthy of the utmost possible confidence.

RECENT PRACTICE IN MARINE ENGINEERING. By William H. Maw. Published at the offices of *Engineering*, London, England, and by John Wiley & Sons, New York.

This work, which is to appear simultaneously in London and New York, in 12 monthly parts, imperial quarto, is intended to give an illustrated account of the leading types of marine engines constructed in the past 10 years, both here and in Europe. Besides marine engines, it will also contain descriptions and illustrations of other machinery, such as dredges, engines for cable towing systems on rivers and canals, &c. Part I will contain: First-Class Torpedo Boat for the British Government, with Compound Surface Condensing Engines; Compound Engines and Boilers of the S.S. Parisian; Steam Launch for Deep Sea Fishing, with Compound Engines; Single Cylinder Compound Engine, constructed by the William Cramp and Son's Ship and Engine Building Company, Philadelphia; Compound Engines and Boilers of the Inman S.S. City of Richmond; Engine for Steam Launch, with Davey-Paxman Boiler; Cottew's Marine Boiler; The Cunard Steamer Gallia. These articles are fully illustrated.

Part II will contain the following, also illustrated: The Cunard Steamer Gallia; Engines for United States Steam Cutters; Engines of H.M.S. Devastation; Paddle Engines of the German Imperial Yacht Hohenzollern; The Steam Yacht "Ariel"; Engines of the United States Revenue Steamer Bache. Letter press, illustrations—in short, the general make-up of the work—are admirable, and the contents are so well selected as to give promise that the work will prove of value to constructors and others interested in marine engineering.

Boracic Lagoons in Italy.

An interesting report upon the springs in the Province of Pisa, Italy, which yield boracic acid, has recently been issued by the United States Consul at Leghorn. The district in which the springs occur belongs entirely to one owner, the Count de Lardarel, who in his seven "borax" villages has most conscientiously looked after the welfare, moral and social, of his workpeople. Although the whole of the neighborhood contains most extensive borax deposits, it is not from these sources that the most abundant supplies are obtained, but from artesian wells, which invariably strike the borax vein at a short distance from the surface. The boring, however, is carried down until the well yields water, when the machinery is withdrawn and water let into the shallow pond previously dug around the borehole. This water becomes heated up to boiling point and impregnated with the borax, which rushes up from the opening of the artesian well, after which the water is drawn off and evaporated by passing it over a series of shallow metal pans, from 15 to 20 in number, arranged like a cascade. The borax as it reaches the bottom pan is half solidified, and when cold has the appearance of being frozen over with a skin of rotten ice. This skin is removed and strewed on the floor of a drying-house, heated by hot pipes, and by this means the borax becomes crystallized. The lagoons have a most peculiar aspect during the issue of the borax. When full of water the boiling is continuous, rising to some feet in hight, and the vapor is unpleasant from its sulphurous odor. The smell of sulphur, indeed, pervades everything about the establishment, and everything in the shape of metal is greatly affected. The brass instruments of the workmen's band are thickly coated with it; silver watches look more like platinum than silver, and only gold of the purest quality keeps its color. The quantity of borax produced from the estate averages from 3 tons to 3½ tons a day, but as this is only one of the borax villages (though the most profitable), the total yield may be put down at 11 tons per diem. Upward of 1800 laborers are employed on the property, of whom 800 are exclusively engaged in the production of the acid.

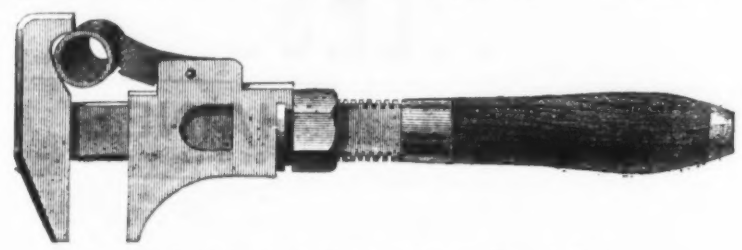
The business of the trust companies of this city appears to be very profitable. According to the reports made to the Bank Department, the Farmers' Loan and Trust, during the last half of 1882, earned net $129,451, or at the rate of 26 per cent. per annum on its nominal capital; the Union, $256,304, equal to 53 per cent.; the United States, $363,238, equal to 36 per cent.; the Central, $220,726, equal to 44 per cent.; the Mercantile, $111,723, or 11 per cent., and the New York, $131,000, or 26 per cent.

Donohue's Improved Wrench.

Mr. Bernard Donohue, of Yonkers, N. Y., has recently invented an improved wrench, which is illustrated in the accompanying engravings, and which embodies several novel and very valuable features. Mr. Donohue's invention relates to an improvement upon a duplex monkey and pipe wrench which he brought out some time since, and which was provided on one side with a yielding spring-jaw, to serve, in conjunction with a stationary jaw, as a pipe wrench.

The object of Mr. Donohue's present invention is to provide improved means for arresting the tail end of this jaw as its forward end is swung out, and at the same time to avoid any increase in the size of the slide. It was also intended to provide an improved arrangement of spring and means for checking the inward movement of the rear end of the jaw as its forward end is swung away from the slide. These objects are attained by forming the slide with a raised seat or solid abutment in the rear end of the recess in which the jaw is pivoted, so that when the forward toothed end of the jaw is swung away from the slide, its rear end will be arrested at the proper moment by the seat above referred to, and the movement of the pivoted jaw is thus limited. A spring is, moreover, located in the recess which is formed in the raised seat, so that the spring, while acting to throw the tail end of the jaw away from the slide, will be pressed within the recess when the forward toothed end is swung out.

In our engravings Fig. 1 represents a perspective view of the wrench, Fig. 2 is a longitudinal section, while Fig. 3 is a view of the pivoted jaw when detached. The



Donohue's Improved Wrench.—Fig. 1.—General View.

stock of the wrench A is provided at one of its ends with a T-head, B, adapted to constitute the fixed or stationary jaw of the wrench, while the other end is provided with a recess, F, between the walls, to which the jaw G is pivoted. The forward end of this pivoted jaw, which extends from the recess of the slide, is provided with an inclined gripping surface, G^1, which is serrated so as to take better hold upon the object to be grasped, while the fixed jaw B^2, on the head of the stock, is concave, with or without serrations, whereby such articles as a pipe or cylinder can be gripped by these jaws in the manner of a pipe-wrench.

In order to relieve the pivot from the strain in turning a pipe, Mr. Donohue makes the pivoted jaw with shoulders, g^2, shown in Fig. 3, which when the jaw is close down in the recess, as shown in Fig. 2, lie against the ends of the vertical walls formed by

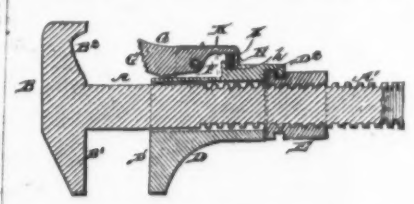


Fig. 2.—Longitudinal Section of Gripping Device.

recessing the slide. The pivot hole is made larger than the pivot, so that the shoulders can take a bearing without throwing a strain on the pivot. Hence when the jaw is turned upon the pivot so as to move upward from the recess, the shoulders g^2 will be brought against these surfaces, and the pin which holds the jaw in place is thus relieved from the strain. In order to effectively limit the movement of this jaw, the inventor also provided in the rear end of the recess a raised seat, H, shown in Fig. 2, which is formed by a projecting portion of the slide at this point. This seat or abutment is located directly under the rear end or tail of the jaw, and is provided with a socket, *h*, in which is fitted a spring-cushion I. The latter is composed either of a metallic spring or fine elastic block of rubber or other elastic material, and acts against the tail of the jaw, thus causing the latter to lie

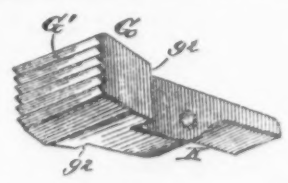


Fig. 3.—Perspective of Pivoted Jaw.

normally in the recess, as shown in Fig. 2, the upper side of the body of the jaw being about flush with the top edges of the sides of the recess. When the front end of the jaw is raised, this spring naturally offers a yielding resistance to the jaw, and in case of very great pressure upon the free end its rear end will compress the spring, and be forced against the seat H. The tail of the jaw is recessed at its under side, as at K, Fig. 2, so as to allow space for the spring and the elevated stop or seat. The spring bears against the tail portion of the jaw some distance back of the pivot, which is at a point forward of the elevated seat. It will thus be seen that these parts of the wrench can be arranged in a compact manner, and that its bulk will not be increased. The wrench is neatly finished, and the outer edges of the slide and double stationary jaw are rounded off, so as to present a smooth and finished exterior.

Our Trade with Mexico.

The State Department has just published a letter from the Secretary, on the commercial relations of the United States with the rest of the world, in which the following figures bearing on the subject are given: During the fiscal year 1880—the latest year of which statistics are obtainable—there were imported into the United States from Mexico merchandise to the value of $8,317,802, of which hides and skins were the most important, footing up to $2,111,750. Coffee came next, $1,730,838; jute and other grasses, $1,634,215; india-rubber and gutta-percha, $315,059; woods, $329,295; lead, $27,661; wool, $99,479; medicinal barks, $147,491. During the fiscal year 1881 there were exported to Mexico from the United States articles valued at $11,191,238, an increase of upward of $3,250,000 in value over the preceding year. This increase covered almost all articles of American manufacture, but was most marked in iron and steel, the increase in products manufactured from this mineral being $1,267,000. Cotton goods, too, of American manufacture find an increased demand, $186,000 worth more being exported during 1881 than during 1880. The principal articles of export to Mexico were as follows:

Iron and steel manufactures	$2,360,044
Cotton manufactures	1,018,649
Woolen manufactures	535,483
Refined petroleum	173,155
Leather manufactures	134,160
Tobacco	135,174
Quicksilver	402,150
Lard	132,597
Sewing machines	179,555
Refined sugar	59,259
Gunpowder	145,397

The Secretary thinks that with the growth of railroads and their attendant industries, and under fairly favorable circumstances, the import trade of Mexico will double its present proportions during the next five years, and he believes that the United States can secure at least half of this if proper care is taken to supply the Mexican market with products of our manufactories of as good quality and at as low a price as our foreign competitors.

Condensed Results of the Tenth Census.

Although we have published from time to time, from advance sheets, much of the information contained in the bulky volume just issued by the Census Office, yet some extracts showing more clearly by comparison the immense strides in our industrial growth during the decade from 1870 to 1880 will be found of interest and value.

In 1870 there were 252,148 manufacturing establishments, with a capital of $2,118,208,769; in 1880 there were 253,852 establishments, with a capital of $2,790,272,606. The wages paid in 1870 was $775,584,343; in 1880, $947,953,795. In 1870 the material used was valued at $2,488,427,242, and the product at $4,232,325,442; in 1880 the material had increased in value to $3,396,823,549, and the product to $5,369,579,191.

STEAM AND WATER AS A POWER IN MANUFACTURES.

The statistics of steam and water power used in manufactures shows a grand total horse-power for the United States in 1880 of 3,410,832; in 1870 of 2,346,142, showing a percentage of increase of 45.38. It may be interesting to note the amount of power available in some of the more important industries and the percentage of increase, and the total number of hands employed in the e industries as reported in the statistics of manufactures, and the amount of power available per hand according to the census of 1880 and 1870, in order to show the relations of the manufacture of iron and steel thereto:

	Total steam and water power. H. P.	Number of hands employed.	Power per hand employed. H. P.	Per cent. of increase in total power.
Cotton goods.				
1880	275,504	185,472	1.49	88.65
1870	146,040	135,519	1.08	
Flouring and grist mill products.				
1880	771 201	58,407	13.20	33.73
1870	576,686	58,448	9.87	
Iron and steel.				
1880	397,247	140,978	2.82	132.75
1870	167,675	77,555	2.20	
Lumber sawed.				
1880	821,928	147,956	5.56	98 09
1870	641,665	149,997	4.28	
Paper.				
1880	123,912	24,422	5.07	132.84
1870	53,218	17,910	2.97	
Silk and silk g'ds.				
1880	8,810	31,337	0.28	361.02
1870	1,911	6,699	0.29	
Woolen goods.				
1880	206,507	86,504	1.23	25.15
1870	85,101	77,870	1.09	
Worsted goods.				
1880	16,437	18,803	0.87	105.05
1870	8,016	12,900	0.62	

The relative amount of steam and of water power used in the manufacture of iron and steel, as returned at the census of 1880 and 1870, was:

	Water power, per cent.	Steam power, per cent.
1880	4.16	95 84
1870	9.72	90.28

In 1880, in the manufacture of iron and steel in 781 establishments, there were used 360 water-wheels of 16,506 horse-power, and 7237 boilers and 3205 engines of 380,741 horse-power, making a total of steam and water of 397,247 horse-power.

MINING STATISTICS.

Under the head of mining, the condensed statement of mineral production of regular mining establishments of non-precious minerals for the United States in 1880 shows some interesting facts respecting iron ore. This ore was mined in 23 States and Territories, 160 counties, and at 805 establishments, producing in the census year 1880, 7,064,829 tons of 2000 pounds; value of product, $20,470,756; value of materials consumed, $2,896,011; men employed, 30.080; boys employed, 1,588; wages paid, $9,538,117; steam engines used, 821, of 24,638 horse-power; value of all machinery, including engines, $3,211,558, and capital employed and invested, $61,782,287. In addition to the above regular product there was an irregular product of 909.877 tons, valued at $2,686,201. In the regular establishments for the same period the value of machinery per ton raised yearly was $0.45; tons raised yearly per horse-power of engines, 284; the same in 1870, 396; value produced pe horse-power of engines in 1880, $824; the same in 1870, $1540; material used per ton, 1880, $0.41; the same, 1870, $0.38; wages paid per ton, 1880, $1.35; the same in 1870, $2.01; value produced per hand per year 1880, $646; the same in 1870, $879; tons raised per hand per year 1880, 223; the same, 1870, 226; wages paid per hand per year, $304; the same, 1870, $455; per cent. of value of production paid for labor, 1880, 46; 1870, 51.8; the same for materials, 1880, 14.1; in 1870, 9.7; value of product per ton, 1880, $2.90; in 1870, $3.89; increase in the number of employees, 110.8; in the value of product, 55; in the tonnage of product, 108.1; in the value of materials used, 126.3; in the total capital employed, 247.6.

COMPARISON OF PRODUCT OF MINERALS.

In referring to the prodution of other non-precious minerals for comparison in the census year 1880, the following figures may be interesting:

	Quantities.	Value.
Anthracite coal, tons	28,649,812	$42,196,676
Bituminous coal, regular product, tons	41,860,055	52,427,868
Bituminous coal, irregular product, tons	916,769	1,090,305
Iron ore, regular product, tons	7,064,829	20,470,756
Iron ore, irregular product, tons	909,877	2,686,201
Metallic copper, lbs	54,172,217	9,458,434
Metallic lead, lbs	162,932,105	7,935,142
Metallic zinc, lbs	62,661,459	4,840,006
Various minerals	..	3,387,444

COMPARISON OF VALUES AND RATES.

A comparison of values and rates paid in different localities shows:

States.	Product.	Value.	Value per ton.	Wages paid per ton.	Mat. consumed per ton.
Michigan	1,837,712	6,034,648	$3.29	$1.40	$0.51
New York	1,239,759	3,499,132	2.82	1.29	0.44
New Jersey	754,872	2,900,442	3.84	2.13	0.77
All others	3,232,486	8,036,534	2.49	1.19	0.26

The Quicksilver Trade.

Reports from San Francisco indicate that the foreign demand for quicksilver at that port has been quite steady for the past three years, the principal markets supplied being China and Mexico. Smaller shipments, of course, are made to a number of other markets, the consignments of which, however, when put together, do not amount to as much as either one of the two principal sources of demand. Of these two China is the more important, though the shipments are made to Hong Kong, rather than to China. The Chinese consume a large quantity of the metal in their compounds, particularly in colors. This element of consumption has long been in existence and is considered permanent, with a prospect of slow but steady increase. Mexico uses the metal extensively in her various mines, and and though the demand last year was less than for any year since 1878, the consumption is not by any means falling off. The decrease in last year's demand is attributed to the fact that in 1881 the demand was greater than for any previous year, though some of the consignments forwarded were lost at sea.

The exports of quicksilver from San Francisco by water for the year 1882 were as follows:

	Flasks.	Value.
New York	1,100	$34,500
China and Hong Kong	19,451	560,718
Japan	600	17,529
Australia	1,690	50,190
New Zealand	105	3,040
South America	1,980	59,437
Central America	65	1,819
Mexico	9,738	289,739
Other ports	28	051
Totals	34,771	$1,017,756

The shipments for the four years previous, which may prove of interest in this connection, were:

	Flasks.	Value.
In 1881	35,264	$1,030,773
In 1880	34,683	1,039,761
In 1879	52,438	1,435,402
In 1878	34,110	1,122,641

In addition to the shipments by water in 1882, it is known that 5183 flasks were forwarded overland in the first 11 months of that year, nearly 50 per cent. of which was sent directly from San Francisco. Prices for 1882 were steady, at an average of about 37 cents. At the close of the year, under a decline in London to £5. 10/ per bottle, the rate here fell to 35 cents per pound, and it is thought that the present demoralized condition of the market is attributable to the threat to put quicksilver on the free list.

The Basic Process in Europe.

It appears from some recently published stasistics relating to the iron and steel trades of the world that there are now in England 23 steel works, with about 115 converters, having a capacity of 1,461,000 tons per annum; Austria has 14 steel works, with 36 converters, and a capacity of 350,000 tons; Belgium, 4 steel works, with 18 converters and a production of 380,000 tons; France, 7 works, with 34 converters, giving a production of 632,000 tons; Germany has 23 Bessemer and Thomas steel works, with 80 converters and a productive capacity of about 1,300,000 tons; Russia has 5 works, with 10 converters and a production of 100,000 tons; and Sweden, 35 converters of 80,000 tons capacity. Adding to these the total number in operation in the United States, we find that there are altogether about 360 converters, with an aggregate annual productive capacity in round numbers of 5,800,000 tons of steel. The suta antial position occupied by the Thomas Gilchrist process is well shown by the large amount of basic steel turned out during the month of October last. In this respect Germany holds the first position, with an output

of 25,170 tons of basic steel by eight firms. England stands next with an output of 9500 tons by one firm. Austria shows an output of 7700 tons by three firms; Belgium, 1687 tons by one firm; Russia, 1270 tons by one firm; and France, 1240 tons by one firm. We thus have a total output of basic steel for the month of October of 46,537 tons by 15 firms. When it is considered that the process is still but little more than in its infancy, this output may be taken as highly encouraging.

The following is a list of the European steel works in which the Thomas-Gilchrist process has been adopted down to the end of 1882. The first column shows the total number of converters at work; the second indicates the number already working the basic process, and the third column gives the number of converters now being constructed for working it:

GERMANY.			
Ars-sur-Moselle	0	0	2
Bochumer Verein	5	3	0
Burblacher Stahlwerke	0	0	2
Dietrich (Niederbronn)	0	0	2
Dillingen	0	0	2
Dortmunder Union	4	2	0
Gutehoffnungshütte	4	2	0
Hörder Verein	0	3	0
Ilsede	2	2	1
Phœnix (Ruhort)	2	0	2
Rothe Erde (Aachen)	1	3	1
Rheinische Stahlwerk (Ruhort)	4	2	0
Stumm (Neunkirchen)	2	0	2
De Wendel (Hayange)	4	4	0
ENGLAND.			
Bolckow, Vaughan & Co	8	4	2
Patent Shaft and Axletree Co	4	0	*2
North-Eastern Steel Co	0	0	4
Staffordshire Steel and Ingot Iron Co	0	0	1
* In course of alteration.			
FRANCE.			
Longwy	0	0	1
Montataire	0	0	2
Saint-Nazaire	0	0	2
Creusot	6	*2	0
Schneider et de Wendel (Joeuf)	2	2	2
Société du Nord et de l'Est	†2	0	0
* And one Siemens furnace.			
† Will shortly work basic.			
AUSTRIA.			
Kladno	4	1	0
Maximilians-Hütte	2	0	2
Teplitz	2	2	1
Witkowitz	4	2	0
BELGIUM.			
Angleur	6	4	0
Athus	0	0	2
LUXEMBOURG.			
Metz et Cie	0	0	3
RUSSIA.			
Varsovie	4	2	0

At the following works the proprietors have taken out licenses to work the basic process:

ENGLAND.			
Blaenavon Iron Works	2	0	0
Brown, Bayley & Dixon	0	0	0
John Brown & Co	‡6	0	0
Charles Cammell & Co	3	0	0
Darlington Iron Works	2	0	0
Dowlais Iron Works	6	0	0
Erimus Steel Works	2	0	0
Steel Co. of Scotland	0	0	0
Wilson, Cammell & Co	4	0	0
‡ Four out of use.			
FRANCE.			
Chatillon et Commentry	2	0	0
Denain	4	0	0
Saint-Chamond	0	0	0
BELGIUM.			
Ougrée	2	0	0

TRADE PUBLICATIONS.

United States Stamping Co.

We have received the illustrated price list and catalogue of the United States Stamping Company, dated January, 1883. This is a book of 151 pages, profusely illustrated, and in its general arrangement is well calculated to meet the requirements of the customers whom it is intended to serve. The salesroom of the company is at No. 58 Beekman street, this city, while the factories and office are at Portland, Conn. One feature we notice in the cover, which distinguishes it from many other trade publications bound in paper, is that on the back edge, in clear letters, appears the name of the company. Thus, if the catalogue is placed with others in a book-case, or lies flat upon the desk in a pile, there is but little difficulty in selecting it when it is wanted. The company direct special attention to their heavy plain pieced ware and heavy polished ware. The objections that have been so strenuously urged against factory pieced tinware of late years have produced a demand for a better grade of goods, and accordingly this company, among others, have given attention to pieced ware made of better stock. We have in the work before us three distinct classes of ware of this character—namely, common pieced ware, heavy plain pieced ware and heavy polished pieced ware. In the preface, being a general circular to the trade, the statement is made that several additions to the lines of manufacture of this company have been made since the last catalogue was issued, and that, in point of finish, quality and durability, the goods produced rank second to none. The most improved methods of manufacture, which it is stated this company employ, and the superior facilities which they possess, give the advantage of producing goods at low cost, and enable them to place their wares upon the market at the lowest figures. A view of the works of the company is given in the fore part of the book, and occupies a double page. Opposite each department of the catalogue the title is printed in the margin of the right-hand page, in such a way as to form an index, after the general manner in which ledger indexes are made. From the fact, however, that the leaves of the book have not been cut for the index, it would seem that this is less convenient to the customer than it would otherwise be, but there is nothing to hinder the leaves being cut as required. The book is attractive in its general appearance, being clean in its typographical features, and printed upon paper well adapted to the purpose.

Merchant & Co.,

of 525 Arch street, Philadelphia, Pa., and 90 Beekman street, New York City, have recently issued a new price list, which contains many features that make it of interest to the trade at large. It is a neat little pamphlet, 3½ x 6 inches, containing 64 pages exclusive of the cover. A comprehensive index is placed in the fore part of the book, so arranged as to be convenient for reference. Following this are lists of various metals and goods handled by this house, arranged with numerous tables that are convenient for use in the tinshop in making estimates and in ordering goods. On the page devoted to sheet copper, for example, is a rule for ascertaining the weight of copper, and other rules relating to the circle, making the page more useful than it would be if this information were omitted. One conspicuous feature is illustrations of the different varieties of soldering irons kept in stock, from which an intelligent selection can be made in ordering by mail. A table of the weights per square foot of galvanized sheet iron is given on page 28, following which is a table of weights of black iron. Corrugated iron is carefully tabulated, giving the spaces of corrugations from center to center, depth of corrugation and length of sheets, with general directions for putting on. Under the head of tin plates, on page 31, is a brief description of this line of manufactures, including an account of the various processes of coating tin plates at present in use. These are known as "hand-dipped" and "patent roll." Concerning the latter, which is now being very generally employed, the statement is made that the sheets are passed through rollers to equalize the coating on the surface, and also to reduce the coating for the purpose of cheapening the plate. The other process, "hand-dipping," without rolling, leaves a heavier coating, and plates manufactured in this way are at present called "old style," "redipped," &c. Tables of gauges and weights of tin plates and wire, tables of rivets, bolts, wrought-iron pipe, lap-welded tubes, together with lists of various specialties, such as corrugated conductor pipes, spiral riveted pipes, registers, &c., make a very useful handbook.

Street Railway Materials.

Messrs. William Wharton, Jr., & Co., Limited, railway contractors, engineers and founders, of Philadelphia, Pa., have just sent us their catalogue relating to street-railway materials. Even a slight inspection will impress the reader with its many attractive features. It is 11 x 9 inches in size and contains 14 phototypes, which, besides enabling the reader to get a very clear idea of the general nature of the manufactures in question, adds considerably to the attractive character of the whole. Plate 1 represents a view of a portion of the works and shows a specimen of the firm's patent curved grooved steel rails. Plate 2 shows Johnson's patent automatic switch in position in the track and pavement in actual use, while the interior arrangement of the switch is shown in Plate 3. As our readers undoubtedly know, this particular switch embodies several points of value, among which we may mention that the driver of a car may, by turning the horses to the right or left, as the case may be, move the switch to the desired position without stopping his car or using any power but the weight of the horse stepping on the plate. The motion of the plates is comparatively small, and the entire apparatus, being flush with the pavement, offers but little obstruction to passing vehicles. Plates 4 and 5 give very neat illustrations of railway turn-tables, which are made of various diameters. Among other appliances may be mentioned transfer tables, which in some instances are preferred to curves or cross-over tracks in depots and car houses. The tables are simple, and repairs are claimed to be very rarely required. Steel-pointed and plated switches and frogs, portable rail-bending machines, continuous crossings, trucks and small turn-tables and wrought-iron frame cars, all receive a due amount of attention, the various engravings submitted in connection therewith being of a character no less attractive than those previously referred to. Plate 8 illustrates the present method of building street railways in Philadelphia and vicinity, a number of cross-ties and a certain length of rail being shown in position, while in the foreground are shown a variety of knees, joint plates and spikes. Plate 13 represents a piece of track work recently made by the firm for a street-railway company of this city. The illustration shows the work as laid out in the yard of the establishment previous to shipment, and is submitted in order to show how the manufacturers prepare this particular class of work. The plate also illustrates a patent crossing where one track is entirely unbroken and continuous, the rails being just the same as if no crossing existed at that place. In the concluding pages of the book Messrs. Wharton, Jr., & Co. submit some of the various sections of iron and steel rails which they are prepared to furnish; 21 different sections are submitted, together with the weight in pounds per yard of each particular section and the special number by which it is known. The manufacturers call particular attention to one of their leading specialties, namely, the preparation of plans for intricate work in front of and within depots and car houses. Altogether, the catalogue is of superior finish. It is provided with a neat cloth cover, and is well worthy of preservation.

Artificial Fuel.

We have just received an illustrated catalogue describing Mr. W. H. Cory's process of manufacturing artificial fuel from coal dust. The method pursued, which has already been extensively noticed in the technical press, is fully described in the pamphlet considered, and a plan is given of an establishment fitted up with the necessary machinery for the purpose in question, and capable of turning out 240 tons in 20 hours. Tables are appended giving the estimated cost of production of the fuel, and also showing the loss to the country for the census year 1880 through not utilizing slack coal. The concluding pages of the pamphlet contain extracts concerning the process, taken from various publications. The catalogue embraces 16 pages, and the interesting information given is undoubtedly worthy of perusal.

Pumps, Windmills, &c.

Powell & Douglass, of Waukegan, Ill., have just sent us copies of their annual for 1883 and also price list of pumps, windmills, &c. The annual is a very neat, well-arranged almanac, with information concerning the goods they manufacture. The portion of their catalogue devoted to windmill apparatus, pumps, &c., is peculiarly interesting,

from the fact that the windmill as a motive power is being largely introduced in almost every corner of the Union, and for water raising, on both a large and a small scale, is exceedingly efficient. One of the noticeable features of windmills is the comparatively low price for which one can be erected and put in running order. From those who have had extensive experience with apparatus of this kind we have received some figures as to the amount of work performed, and it is surprisingly great. Whether large mills will ever be able to compete with steam as a motive power for driving machinery is doubtful, but it does seem certain that for domestic purposes, irrigation, and even for the water supply of towns and villages, the windmill has an extensive field to itself.

The Use of Ivory in the Sheffield Cutlery Trade.

United States Consul Webster, in a recent report, gives the following interesting facts relating to the above subject:

Sheffield, as is well known, is the home of the cutlery trade in England, and by far the most important center of that industry in the world. It was born there. Three hundred years ago Sheffield had gained a reputation for the making of good knives. The poet Chaucer speaks commendably of the "Shefeld thwytel," and a writing master in 1580, giving directions about quills, penknives, &c., says: "First, therefore, be the choice of your penknife—a right Shefeld knife is best." This reputation embraces also razors, and continues until the present day. If we inquire as to the secret of the excellence of Sheffield cutlery the steel maker will tell us that the superiority of his steel is at the bottom of it; the forger at his anvil will say that the fine grain necessary to produce the best cutting edge is given to the steel by the blows of his hammer, and that no machine-made blade can equal his; the temperer will claim to possess some secret of especial efficacy, and others will confidently affirm that there is some peculiar virtue in Sheffield water that is imparted to the steel in the process of hardening. In proof that this latter belief exists is the fact that a few years since, when a company of Sheffield cutlers went to the United States to make razors, they took with them a cask of Sheffield water, they having no faith in the "Yankee" article. The Sheffield cutler believes he can hold his own against the world, and the world's demand for his justly celebrated wares will go far to confirm his belief. During the ten years ending with 1881 Sheffield has sent cutlery to the United States alone to the value of $10,755,892, or more than $1,000,000 annually. The amount required to supply the home market is about the same as that taken by the United States, or $1,000,000 annually.

First in importance for the making of good cutlery is, of course, the steel for the blade. Next comes the material that forms the handle, which it is the principal purpose of this dispatch to consider. The substances thus used are various, and the whole world is laid under contribution to supply them. They consist of ivory, pearl and tortoise-shell, stag, buck, buffalo, and all other kinds of horn, bone, foreign woods, and various patent substances known by the names xylonite, parksite, ebonite, &c. The cutting of these various materials into sizes and shapes suitable for use by the cutter is a very large business by itself, and, with the purchase of the material, requires a large outlay of capital. For instance, one dealer in Sheffield tells me that his firm had on their premises at one time ivory to the value of $400,000. No such stocks are kept at the present time. The business of furnishing the material for handles is known by the general term of scale-cutting, the word scales being used to denote the pieces, of whatever material, that go to form the handle in all kinds of pocket knives and cheaper grades of table cutlery. The business embraces also the cutting of solid handles from ivory, pearl, shell and other material for the best kind of table cutlery. Some cutlers purchase the material and cut their own scales, but it is usual to purchase of those who make this a separate business. Of all materials ivory holds the first rank. The sources of supply of this increasingly valuable material are Egypt, the east, west and south coasts of Africa, and the British East Indies.

The following table will show the quantities imported into Great Britain during the year 1880, and from what countries:

	Cwt.
Holland	431
France	61[illegible]
Egypt	2,0[illegible]
Portuguese Possessions, West Africa	361
West Coast of Africa, not designated	2,31[illegible]
East Coast of Africa, native States	1,0[illegible]
British Possessions, West Africa	102
" " South Africa	1,114
British East Indies	2,972
Malta	411
Aden	69
Other countries	1,267
Total	13,41[illegible]

Malta is the port of shipment to England of ivory that finds its way to Tripoli and other points on the north coast of Africa. To Holland ivory is brought from her possessions on the coast of Africa. France receives but little except what has been purchased in England, portions of which are sometimes returned. The Bombay, Siam and Zanzibar ivory is bought for the making of piano keys, carvings and other expensive articles of luxury. All ivory from the east coast of Africa, except the Cape, comes through Zanzibar, and pays a royalty to the Sultan. It is known to the trade by a mark, a rude figure of an elephant, that is put upon it after the payment of the royalty. It is said that this mark is sometimes erased from tusks that are to be sent to the United States from the sales in England. Is it to prevent identification when this ivory arrives in our country, and thus to evade the duty chargeable upon "goods the product of countries of the Cape of Good Hope, when imported from places west of the Cape of Good Hope?" Mammoth tusks from Siberia occasionally come to this market, but as they have been lying exposed for centuries, probably for many thousands of years, often buried in ice, the "nature" has gone out of them, and they are not suitable for the cutler's use. The teeth of the walrus and hippopotamus are used in considerable quantity. Being of suitable size, they are used whole for making expensive carved handles. Ivory of the best quality comes from the west coast of Africa, under the names Cameroon, Angola and Gaboon. This is brought down from the interior. It retains a larger proportion of the "fat," or gelatine, from the fact, probably, that it is more recently from the animal. In this state it is called "green" ivory. It is more translucent and not as white as the Egyptian and other kinds, called "white" ivory, that have been lying a longer time and in a more sandy region, exposed to the heat of the sun until the animal matter has disappeared. The excellence of the "green" ivory consists in its greater toughness, and in its growing whiter by age, instead of yellow, as is the case with the whiter varieties. Yet buyers of cutlery, through ignorance of these qualities, usually prefer the whiter kinds, which on that account are more in demand for the Sheffield trade, and are said to have nearly doubled in price since 1879.

The sales of ivory occur every three months at London and Liverpool. Sales are also held to a limited extent and at irregular intervals at Rotterdam. At Liverpool only ivory of the best quality—that from the west coast of Africa—is offered. Buyers from Germany and France, and agents of American consumers, attend these sales. It is estimated that about one-quarter of the whole amount sold is taken by Sheffield buyers; another quarter goes to London; the remaining one half goes to Germany, France and the United States. The experienced eye is quick to discern the value of a lot of ivory, assisted by a knowledge of the country from which it comes, which is essential. It is said that the electric light is beginning to be used to test the soundness of the tusks. The stocks of ivory in public warehouses in this country are smaller at the present time than for many years, and the rapid advance in prices is a cause of considerable anxiety to manufacturers. The highest price paid at a recent sale in Liverpool for the best African ivory was at the rate of $6740 per ton, or more than $3 per pound. The cost of this material explains the fact that the principal factor in the value of the best table cutlery is the handle.

When the ivory comes into the hands of the cutler, much skill is required to make the most of the precious material. Every scrap is turned to account. After cutting out all the scales of all sizes for pocket-knives, and the solid handles for table cutlery, the small pieces may be sold to the button-makers or are made into "pearls." Pearls are small pieces of ivory, pearl or horn inserted into the handles of tea and coffee pots as non-conductors of heat, so-called because originally made of pearl. The fine sawdust is sold for fertilizing purposes, for the making of gelatine and a fine white sizing for the manufacturers of lace curtains and other fabrics. The refuse still remaining goes to the makers of ivory-black. The proportion of this residuum, dust and refuse is about 10 to 15 pounds to the cwt., and it sells for $80 to $100 per ton. Efforts have been made to devise some method of solidifying ivory dust, but as yet without success.

Skill is required in the cutting of ivory, as of wood, to bring out the beauty of the grain. The saw of the cutter occasionally reveals a rifle-ball that has been lodged in the tusk and has been completely covered by subsequent growth. About one-third of the length of the tusk, where it enters the head of the elephant, is hollow. This hollow, when the tusk is in place upon the live animal, is filled with a soft pulp or core, which supplies the growth of the tusk. A ball lodged in this core will in time become imbedded in solid ivory. This hollow portion is cut off and sold separately, except the thinnest portion, as bangle ivory, and is in great demand for bangles or ornamental rings for the ankles and arms of Indian and African women. That portion of the tusk toward the point is usually more solid and of finer grain. This is cut off and sold by itself at high prices under the name of billiard-ball points. Small teeth of from 10 to 15 pounds weight are called, in the trade, scrivelloes. The points of these small tusks are used in their natural state for making handles to expensive carving sets and other articles of luxury. The large proportion of very small tusks brought to market indicates how many elephants die in early youth. To show to what size many of these might have attained, the well-known cutlers, Joseph Rogers & Son, of Sheffield, exhibit at their show-rooms an African elephant's tusk 9 feet long, 21 inches in girth, weighing 160 pounds. This is among the largest tusks on record, and its present value is estimated to be $650.

French Trade for 1882.—The summary return of imports and exports for the past year, published recently, as compared with that of 1881, is as follows:

	1882. Francs.	1881. Francs.
IMPORTS.		
Food	1,[illegible]30,86[illegible],000	1,690,365,000
Raw materials	2,314,203,000	2,320,[illegible]04,000
Manufactures	673,503,000	574,702,000
Miscellaneous	297,504,000	277,737,000
Total	4,972,07[illegible],000	4,863,4[illegible]8,000
EXPORTS.		
Food	866,513,000	871,612,000
Raw materials	695,[illegible]2[illegible],000	671,[illegible]17,000
Manufactures	1,857,495,000	1,836,[illegible]9,000
Miscellaneous	17[illegible],012,000	1[illegible],150,000
Total	3,[illegible]9[illegible],1[illegible]4,000	3,5[illegible],504,000

The above figures show an increase under imports of 108,000,000 francs, and under exports of 34,000,000 francs. The great increase under imports is almost entirely due to the item "manufactures," which shows an augmentation of no less than 98,000,000 francs. The increase in the case of exports is divided between "raw materials" and "manufactures." The impression produced by the return is exemplified by the following remarks of the *Temps*: "Thus we are doubly losing ground—abroad, where our markets are becoming narrowed, and at home, where foreign products are gradually gaining ground on us. Such being the situation, the national interest demands that employers and employed should make a joint effort to resist the competition which is threatening them both. They will only succeed in averting a crisis by redoubling and uniting their efforts."

The Iron Age

AND

Metallurgical Review.

New York, Thursday, March 1, 1883.

DAVID WILLIAMS *Publisher and Proprietor.*
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CONTENTS.

The Situation and Outlook in Iron.

The present situation in the iron trade is a matter of surprise to very many who take their views of things more from their experience of two or three years than from the happenings of a series of years. They are surprised that, with the general prosperity of the country such as we indicated in an editorial in our last issue, there should be such an extraordinary condition of dullness and low prices in the iron trade; but if they would stop to consider some of the general principles which underlie trade, and would turn over in their minds the condition of affairs during the last 10 or 20 years, they would not be surprised. While it needs no argument to prove that the law of supply and demand regulates the prices of articles and determines the condition of the market, at the same time it is a truism that in its application to business it assumes varying forms. There is at times in connection with trade what is known as "speculative consumptive buying," or, in other words, consumers in certain conditions of the market buy ahead of their immediate wants. That condition is when prices are either fixed or advancing, and when there is a possibility that the consumer may not be able to get the article he wants—iron, for example—when he wants it. In such cases they will anticipate their wants, and buy to meet the future. On the other hand, when prices are weak and declining, and the capacity for supplying demand is such that that there is no reasonable doubt but that buyers can get all the iron they want and when they want it, there will be no anticipation of future wants, and consumers will buy "from hand to mouth," as the saying is.

Now, apply this to the iron trade. In the condition of things two years ago, when prices were advancing, when the demand for manufactured articles from all over the country was pressing, and when the capacity of the mills was such that it was questionable whether all the buyers could get what they wanted when they wanted it, there was a strong pressure of orders for future delivery, which of course resulted in advancing prices. To-day, however, this condition of affairs does not exist. Buyers seem convinced that there can be no advance in the price of iron, that the only change must be downward, while at the same time they are also equally convinced that they will be able to buy all the iron they want at any time they want it. For these reasons they are only buying for their immediate demands, fully expecting that when they shall need iron during the coming year they will be readily able to procure it, and at least at the same rates as at present, if not lower.

Now, what is the outlook for the future? In the first place, Congress is about to adjourn, for which the business interest of the country cannot be too thankful. Thousands of merchants and manufacturers would not venture to act for the future until the tariff and the internal revenue taxes of the coming year were settled, and with Congress out of the way they will begin to prepare for the year's business on the basis existing, whatever it may be. This certainly must give a new impetus to business. In addition to this, floods in Europe and a partial failure to put in seed for the crop of 1883 seem likely to increase the demand for American products very largely. If the floods and frosts in the West prove to have injured the winter wheat, there will be a more active movement in the great staples. Farmers are able even now to get better prices because of these things, and with more liberal sales of holdings will come increased traffic to the railroads, increased purchasing power and necessity of purchasing on their part, as well as on the part of farmers throughout the country. In connection with all this, the country seems to be going through a period of gradual and wholesome readjustment of the relations of supply and demand, which will be followed by a more general activity in all lines of business. Speculation also does not seem to be as rampant as it was, and probably will not be, for the reason that people have not so much money to lose.

Of course, no one can tell really what the future is to be. There are too many "ifs" in the way; but if Congress does not do any mischief, and if manufacturing and buying get on a healthier plane, and if no trouble comes to the money market, which does not seem likely, and if the peace that has been patched up between the railroads continues, there may be a genuine and substantial improvement this year; but whether there is a marked improvement or not, we certainly can see no reason in the situation for any alarm, but rather everything to encourage the country.

We have no doubt that every thoroughbred free trader thinks he has a mission in life, and that it is his duty to make his views known at all times, but even a sense of duty should not be held to excuse conspicuous breaches of good taste. For example, when the American Institute of Mining Engineers met in Boston last week, Mr. Edward Atkinson was selected by the local committee to deliver the address of welcome. Instead of dwelling upon subjects connected with or related to the work of that society, Mr. Atkinson took advantage of the opportunity to make a very specious and trivial free-trade argument, stating with entire confidence propositions which have been distinctly disproved by the experience of the country, and which are simply the shibboleths of the doctrinaire school of political economists, who are disciples of Adam Smith and cling to ideas which even England has found to be Utopian. If Mr. Atkinson's argument had been made under other conditions, there were a dozen men in the audience who would have enjoyed the easy task of refuting it with proofs showing conclusively that he did not know what he was talking about. But an alleged address of welcome is not usually considered open to discussion, and the audience was under the obligation of courtesy to take its unwelcome and wholly unexpected dose of medicine. Of Mr. Atkinson's argument we can only say that it was exceedingly short-sighted and shallow, and that his illustrations were of the kind which in discussion would have been turned against him with ruinous effect. He no doubt thought it an excellent hit to point to the idle works of the Revere Copper Company as showing how Boston is being ruined by protective duties; but one of the speakers at the dinner pointed out the enormous profits which Boston capital is earning in Colorado, Lake Superior and elsewhere, and gracefully concluded by saying that if we must drop a tear for Boston's ruined industries, let it not be over the Revere Copper Company. The fact of the matter is, Boston has had the lion's share of the benefits of protection in lines in which protection is less needed than in any others, and, should protection ever be abandoned, Boston will have good reason to mourn over millions invested in undertakings rendered unprofitable by legislation hostile to domestic industry and to the development of the West. But however this may be, the meetings of the Institute of Mining Engineers are not the place for such discussion, and Mr. Atkinson is likely to derive from his effort no other satisfaction than that which the sense of having taken an unfair advantage of an audience may be supposed to give him.

The Tariff Muddle.

The changes in the situation at Washington regarding the tariff are so frequent that it is utterly impossible to forecast the result. One day all hope of passing the tariff seems to be abandoned; the next some scheme is suggested by which it is expected to secure action. One day the Kasson rule is proposed, and the next the Haskell rule, and then a paper is passed around the House for signatures of members agreeing to vote to send the bill to a conference committee. This has hardly started on its rounds when a number of Representatives declare their purpose to use all means in their power to defeat the bill on the ground of the Constitutional inability of the Senate to prepare such a bill, and so the kaleidoscope turns, no one knowing what figure the next movement will show. One thing, however, is very certain—that before this paper reaches many of our readers the question will have finally been settled, as Congress must expire by its own limitation on Saturday. At the present writing the situation seems to be in the control of Pennsylvania and Ohio, the largest iron-producing States. The Members of Congress and Senators from those States believe that an attempt has been made to sacrifice their industries to satisfy the popular clamor in certain States for a reduction of the tariff, while the industries in which those States are interested have hardly been touched. The Pennsylvania and Ohio members do not intend to furnish all the lamb for the sacrifice, but propose that other States shall provide their part of it. The great trouble with this Congress seems to have been want of leadership. In this respect it has been a most extraordinary body, and its temper has changed so often and on such slight provocation that it may be set down as the "unstable Congress." Its action on the Civil Service Reform bill was an indication of this. It is always a public misfortune when a legislative body is destitute of competent and trusted leaders. Like a rudderless ship tossed about by the tempest, it is at the mercy of every wave of passion or wind of selfish interest.

The Spelter Situation.

The fact that the value of spelter has gradually declined to a point as low as lead calls for an investigation of the causes that have brought about this extraordinary depreciation. Importation of spelter into this country in 1882 was at the rate of nearly a thousand tons of 2240 pounds per month, whereas the previous year it did not exceed, during the entire twelve-month, 1500 tons. The supply from abroad, therefore, last year reached altogether about 12,000 tons, domestic production added thereto 27,000 tons, and as 1882 had commenced with a stock of a couple of thousand tons, there were at the disposal of American consumption last year 41,000 tons of spelter. As at the same time the importation of sheet zinc had more than doubled, while the domestic export barely reached the figure of 1881, there resulted a stock at the centers of distribution of something like 7500 tons of spelter and sheet zinc on January 1, 1883. This heavy stock alone during the dull winter months would have been sufficient to keep down the price, but there were other causes. The dullness of the iron trade extended to galvanized barb fence wire, an article which has grown into great importance, not only for domestic use, but for shipment to the great grazing countries of the world. Galvanized nails, hollow-ware, &c., also became dull, and the demand for spelter fell off considerably in this direction, while the close of the building season and the lessened production of refrigerators and other house-furnishing articles requiring sheet zinc caused the sale of the latter, as well as of zinc white, to dwindle down to insignificant proportions. Aside from this, one of the leading spelter producers out West sold for a great part of the time at a fraction below the market, on the spot as well as to arrive. The reasons for doing so were, we presume, on the one hand the wish not to accumulate stock, and on the other to discourage, for a number of months to come, a resumption of importation. The same concern, at the comparatively low prices it sold at, was still more of a gainer than its competitors, inasmuch as the sulphuric acid it simultaneously obtained more than made up for any shortcomings in the price of the metal. It is hardly to be supposed that in the face of a downright loss, and under the circumstances we have given in detail, importation will be seriously resumed for months to come, nor is there at present any prospect that the price in Europe will decline sufficiently to leave a margin to the importer at our current low rates for the metal.

As for the prospects of a full resumption of consumption on this side at no distant day, the outlook is not encouraging for the moment, but this may change with a revival of the spring demand. Not unlikely, the sheet zinc demand will be the first to manifest itself; there are, indeed, even now indications that this will be the case, for we perceive that Western producers are increasing their price. Next the barbed fence wire demand is likely to look up as we advance into the spring and summer months, not only for domestic purposes, but for export. The Argentine Republic and most of its neighbors are in a flourishing condition, not only agriculturally, but also as to cattle farming and sheep breeding, all stimulated by a steady flow of immigration from the Mediterranean, and, as peace prevails in those countries, our trade thither steadily expands. Then there is the building season. Although most people seem prepared to see a lull therein as a natural reaction, and as possibly a decline in real estate may intensify such lull, yet a fair amount of building may, we think, be counted upon. In a month or so we shall be able to form a better judgment of the prospect in this direction. Immigration may not reach the magnitude of 1882 and 1881, but we may still expect a very large influx. Much will, of course, depend on our next crop of cereals; meanwhile our farmers are getting a better price for the remains of the old crop than they could reasonably have expected three months since—all due to the mishaps that have befallen Europe.

Taking into account the circumstances we have noted, it will be seen that the condition of spelter is not altogether hopeless. It is more than likely that it has reached its lowest point, and will now take an upward turn. The tables below show the price of spelter and zinc in the London market since 1875:

HIGHEST AND LOWEST PRICE FOR SILESIAN SPELTER.

1882.	1881.	1880.	1879.
£17. 12/6	£18	£21. 10/	£20. 12/6
£16. 10/	£15. 5/	£15. 10/	£13. 17/6
1878.	**1877.**	**1876.**	**1875.**
£19	£21. 5/	£25. 7/6	£25. 5/
£10. 10/	£19. 5/	£22	£23

HIGHEST AND LOWEST PRICE FOR SHEET ZINC.

1882.	1881.	1880.	1879.
£21	£21	£24. 7/6	£21. 15/
£19. 5/	£18. 7/6	£18. 15/	£17 17/6
1878.	**1877.**	**1876.**	**1875.**
£22. 15/	£24. 15/	£29. 5	£29. 10/
£20	£22. 10/	£25. 15/	£25. 5/

So far this year the price of spelter is lower than the lowest of 1882.

On both sides of the Atlantic the year commences with great weakness, but we think the elements for a sound recovery are not lacking on this side, as we have shown.

The Prosperity of Germany Under Protection.

One of the most striking features in the industrial development of Europe in the past ten years has been the rapid advances in connection with coal mining and metallurgy which have taken place in the German Empire. Shortly after the close of the Franco-German war, a period of most distressing depression came upon German industry and arrested the progress of coal mining and checked the development of metallurgy. Bismark, with wonderful foresight, and in opposition to the views of those who had been his closest associates and of the party with which he was identified at the time, determined to adopt protection, and it has been under the fostering influence of the tariff laws carried through the Reichstag by Bismark that this wonderful development to which we have referred has come about. Though, as yet, under this system the price of labor has not advanced materially, the labor in the iron works and coal works has been employed, and iron and coal have not to any great extent come into that country from abroad, which, if it had, would not only have deprived labor of employment, but reduced its rewards. No doubt there was present in Bismark's mind when this policy was finally decided upon not alone the prosperity of German labor and capital, but also the condition, the surroundings, the environments of the Empire. With a jealous Russia on one hand and a revengeful France on the other, the possibility that trouble with either might involve trouble with other nations, thereby completely closing German ports to their products, had to be seriously considered. Indeed, we think his statesmanship would have been very short-sighted had he not adopted that policy which would lead to the development of the mines and works of Germany, not only to the extent of supplying home consumption, but of laying the surrounding nations under tribute to German manufacturers.

Is it not strange that when other nations whose statesmanship is certainly as far-seeing as that of this country conceive it to be to their interest to develop and foster their iron and coal industries, the Senate of the United States should conceive it to be proper statesmanship to do all in their power to restrict the development of the iron and coal industries of this country? The improvement in these industries will, without question, be the mark of the improvement in material prosperity. They largely underlie the whole fabric of our industrial development, and whatever injures them, whatever serves to depress them, cannot fail to injure the whole structure of our industries. So far as the views of the Senate, as evidenced by their action on the tariff bill, are adopted in this country, so far will these industries be injured.

Rail Consumption in the United States.

The statistics of iron and steel rail production in the United States, which were published last week, showed that in 1882 there were 1,507,851 gross tons made, of which 203,458 tons were iron, and 1,304,393 tons were Bessemer and open-hearth steel. The official report of our iron and steel imports in 1882 has not yet been issued by the Bureau of Statistics, but we are in possession of sufficient information to estimate the importation of rails at 200,000 gross tons, of which 37,500 tons were iron and 162,500 tons were steel. By adding the imports to the production, we obtain 1,707,851 tons as the probable consumption of iron and steel rails in this country in 1882. The consumption of rails in 1881 was not far from 300,000 tons greater than that of 1882. The production of iron and steel rails amounted to 1,646,518 gross tons, and the imports were 344,930 tons, making the probable consumption 1,991,448 gross tons. The following table will show the variation in the details of the rail trade for the two years referred to, in gross tons:

1881.		
Iron produced	436,733	
Iron imported	122,313	
Total iron	558,566	
Steel produced	1,210,285	
Steel imported	222,597	
Total steel	1,432 882	
Total consumption		1,991,448
1882.		
Iron produced	203,458	
Iron imported	37,500	
Total iron	240,958	
Steel produced	1,304,393	
Steel imported	162,500	
Total steel	1.466,893	
Total consumption		1,707,851
Excess of 1881 over 1882		283,597

It is a remarkable fact that the whole of the falling off here recorded is in the consumption of iron rails. In 1882 there were used 317,608 tons of iron rails less than in 1881, while of steel rails there were used 34,041 tons more than in 1881. Iron rails have long been doomed to complete displacement by steel, and we have seen steel rapidly gaining from year to year, but in no year has there been such a complete collapse in the use of iron rails as was witnessed in 1882. So utterly has the iron-rail trade been routed that iron rails are no longer openly quoted in our leading iron markets. Iron rails will still continue to be made in some localities of this great country, owing to various circumstances, but they will henceforth play but a small part in the tables of annual rail consumption.

The following table of the consumption of iron and steel rails in the United States for the past 11 years has been obtained in large part from the reports of the American Iron and Steel Association. It shows how the steel-rail trade has gradually overtaken and finally surpassed the iron-rail trade during this period. In this table the imports are added to the production in each case. The are of 2000 pounds:

Years.	Iron.	Steel.	Total.
1872	1,286 994	243.856	1,530,850
1873	860,263	288.580	1,148,849
1874	592,265	245,459	837,724
1875	501,823	309 137	811 960
1876	467,455	412,461	879,916
1877	332,540	432.2 4	764,744
1878	322,890	569,805	882,695
1879	439.250	718,170	1,157,420
1880	626,221	1,120.305	1,752.526
1881	625,594	1,604,828	2,230,422
1882	209,874	1,642,920	1,912,794

An examination of this table will show that the consumption of iron rails steadily decreased from 1872 until 1878, when a temporary reaction set in, which was caused by the great demand for rails of all kinds during the railroad fever of the next three years, but not even in 1880 did the consumption of iron rails attain half the proportions of the consumption of 1872. The reaction spent its strength in 1881, and in 1882 the consumption of iron rails fell off largely, reaching in that year the lowest figures in the 11 years under review. The consumption of steel rails, on the contrary, after a slight reverse in 1874, steadily increased from year to year, not even excepting 1877, when the railroad interests of the country were most seriously affected by financial difficulties, short crops, labor riots, &c. And although fewer rails were laid in 1882 than in 1881, the figures show that the consumption of steel rails actually increased in the

former year over the latter. At present the outlook is not favorable for a continuance in the increased consumption of steel rails, the demand now being considerably under that of last year.

The New South Staffordshire Sliding Scale.

Alderman Avery, the president of the Board of Arbitration of the South Staffordshire mills and forges, has just given his award regarding the matters submitted to him for settlement. The award contains much that is of interest to the manufacturers and workingmen on this side of the Atlantic, as well as in England. The question was upon what basis a sliding scale, which it was agreed upon should be re-established, should be formed—that is, whether it should be the rule of shillings to pounds, with 6d. or a shilling additional, the minimum having been fixed at 7s. 3d. Alderman Avery awarded that the wages of puddlers to the 31st of December, 1882, should be 8s. per ton; from that time to the 31st of March, 1883, 8s. 3d. per ton. After providing for the manner in which the average selling price should be obtained—by the inspection of the books of certain agreed firms by agreed accountants every three months, the price so ascertained to be the price on which wages shall be based for the ensuing three months—the arbitrator awarded that the sliding scale for puddlers should be 9d. per ton in excess of 1s. for each pound sterling in selling price, and for a fractional part of a ton as follows in addition:

From over	2s. 6d.	to 5s.	3d.
"	5s.	to 7s. 6d	3d.
"	7s. 6d.	to 10s	6d.
"	10s.	to 12s. 6d	6d.
"	12s. 6d.	to 15s.	9d.
"	15s.	to 17s. 6d	9d.
"	17s. 6d.	to £1	1s.

A sliding scale has been in operation at various times in South Staffordshire, but its working was not satisfactory to the men, and they refused to continue it. It is now resumed, however, and it is a remarkable fact, and one that should go far to disabuse the minds of the ironworkers of this country of the idea which some of them have, that under arbitration prices are reduced, that for many years the rule for the price of puddling in England was shillings to pounds, and this ratio was not increased until arbitration increased it. While it is true that prices of puddling have advanced largely and declined largely during the existence of arbitration boards in England, it is also true that the ratio of the price of puddling to the selling price of iron has increased under arbitration. We believe workingmen will come to realize this in time, and, as we have so often said, we have no fear but finally arbitration will be accepted as a means of settling labor disputes in this country.

Steam Tonnage in American Ports.

Competition in the ocean carrying trade is now little more than a contest between different lines of vessels propelled by steam. Sailing vessels only play an inferior part, and for various reasons the substitution of steam has inured chiefly to the benefit of the foreigner. The transition from sail to steam navigation is forcibly shown by the following table, in which the number of foreign arrivals at this port is given for a series of years:

FOREIGN ARRIVALS.

Years.	Steamers.	Ships.	Barks.	Brigs.	Schooners.	Total.
1824	.....	260	4	315	331	912
1844	3 471	351	929	451	2,208
1855	163 767	715	1,148	597	3,331
1859	268 713	872	1,269	885	4,007
1865	455 625	1,492	1,134	1,042	4,710
1877	1 674 380	2,234	1,076	1,451	6,244
1879	1,591 681	3,234	1,028	1,548	8,077
1882	1,945 407	1,867	896	1,371	6,476

Of the arrivals for 1882, no less than 1168 were British steamers, against 197 American. The latter were outnumbered even by the Germans. Statistics show that in the year just expired the entire American merchant marine comprised a tonnage of 4,057,734 tons, of which about 1,300,000 was engaged in the foreign trade, or only one-half the amount employed in that trade in 1861, when the merchant marine of the United States reached the maximum of its prosperity. Bearing these facts in mind, the fast increasing preponderance of foreign tonnage in American ports is strikingly illustrated in the following comparative table:

ARRIVALS AT AMERICAN PORTS.

Years.	British.	German.	American.	Total of all foreign nations.
1856	935.886	166,837	3,194,275	4,464,038
1860	1,262,874	230,828	3,301,903	5,000,194
1866	2,412,318	420,576	1,891,453	5,008,487
1872	3,783,002	782,604	2,584,646	7,769,986
1877	4,491.946	806,730	2,957,791	10,406,488
1880	7,963,059	1,089,740	3,128,374	15,240,534
1882*	9,500,000	1,250,000	3,260,000	18,500,000

* Estimated.

In the face of such a showing, no wonder that Congress, in its last hours, feels constrained to give the shipping bill a share of attention.

The circulars of the Boston Manufacturers' Mutual Fire Insurance Company are about as instructive reading as one comes across. In their way, they are eminently models of how to condense facts and statistics and give the substance of the matter in the most compact form. Here is a little statement that may be of interest to others besides the dry-goods men, whose property is most immediately involved. In about 100 acres of buildings in New York City in the dry-goods district the value is probably over $500,000,000, or, say 2 per cent. of the entire capital of the United States. This pays an insurance of a million and a half a year. Speaking of a roof hydrant service for this district, one of the circulars says that it could be put in at the present time at a cost much within $2000 per acre. Steam pumps would bring the cost up to $7500, or $750,000 for the 100 acres of buildings we have mentioned. This apparatus would effect a saving of at least one-tenth in the rate of insurance, and this would be equivalent to a dividend of 20 per cent. on the amount invested in the apparatus.

The Duty on Iron Ore.

February 26th, 1883.

To the Editor of The Iron Age.—DEAR SIR: Messrs. Cooper, Hewitt & Co. in your last issue dispute the statement that Mr. Hewitt "probably consumes five times as much crude metal as he produces in his blast furnaces in New Jersey." If they have any facts to controvert this position, it is about time to produce them, as Mr. Hewitt's course on the ore question has been one of dogmatic assumption, without sustaining facts. The estimate with regard to his consumption of crude metal was based upon a production of 40,000 tons of finished metal per year at the two Trenton mills, taken from his own statements and the records of the American Iron and Steel Association, and as it requires 1¼ tons of pig iron to make 1 ton of such products as are made at the Trenton works, the entire consumption of pig iron would be 50,000 tons. The capacity of his furnaces in New Jersey, if run full time, would be about 20,000 tons per year, but, as Mr. Hewitt's furnace practice is notoriously uncertain and irregular, the allowance was made for running one-half time, equal to 10,000 tons per year, or one-fifth the quantity necessary for the Trenton works. Your correspondent feels entirely safe in saying that Cooper, Hewitt & Co.'s books for the last three years will corroborate this statement. That they use scrap iron and imported wire rods instead of pig iron only aggravates the situation, as these articles displace a larger amount of pig iron, and, in proportion, diminish the demand for labor in the production of iron ore. The bandying of epithets is a poor method of discussion, but Mr. Hewitt seems to act on the principle of abusing his opponents where he has the worst of the argument. In order to give him an opportunity to clear up the ore and scrap question, there are stated herewith six distinct misstatements, untruths, or, in his own way of expression, falsehoods, made by him on various occasions.

No. 1. That his firm are the largest miners of iron ore in New Jersey. (See letter in *Engineering and Mining Journal*, January 7, 1882.)

No. 2. That every ton of foreign ore brought here enables a ton of our ore to be used which would otherwise find no market. (See letter as before.)

No. 3. That in New Jersey and Pennsylvania there is not a pound of ore that is not put on the cars for less money than the freight from Africa and Spain to New York. (See Tariff Com. Report, p. 1084, line 10, &c.)

No. 4. That the freight of foreign ore averages from fifteen to twenty shillings. (See Tariff Com. Rep., p. 1086, line 8, &c).

No. 5. That no foreign ore is sold here at less than six dollars per ton. (See letter to S. S. Cox).

No. 6. That cheap scrap iron and pig iron are friends, and not enemies. (See letter to S. S. Cox).

If Mr. Hewitt has stomach for discussion of these items, the ore producers would like to hear from him. His idea of tariff reform is similar to Artemus Ward's patriotism, when he proposed to prosecute the war even if he sacrificed all his wife's relations.

JERSEY ORE.

Bilbao Ore.

PHILADELPHIA, February 26, 1883.

To the Editor of The Iron Age.—SIR: Your editorial of February 22, on "The Production of Spanish Iron Ore," treats only of shipments from Bilbao, of little practical interest to Americans, and in some respects calculated to mislead those unfamiliar with the importation of foreign ores. The shipments from Bilbao are not now, nor are they very likely in the future to be, of more than statistical value to ore consumers or miners in this country, for the pertinent fact that not one-hundredth part of all the ore mined and shipped at Bilbao finds its way across the Atlantic, for the reasons stated below.

In your editorial you say: "Nature has most favorably endowed this locality in every respect for the easy production and shipment of iron ores. The city of Bilbao is is on the Bilbao (?) River, which is navigable for large vessels, and is only seven miles from the sea." In Hunter & Patten's "Port Charges of the World," Bilbao is described as "On the river Nervion, 10 miles from its mouth. The harbor of Bilbao lies between Puento Galea on the east, and Puento Lazuero on the west. The water in the harbor varies from 5 to 10 and 14 fathoms; there is a bar at the mouth of the river, with a depth at low water of 12 feet; at high water 15 feet may be depended on. The channel is continually changing, and heavy seas on the bar are of frequent occurrence. Vessels never, except in the finest weather, or to avoid running on to an impracticable bar and lee shore, anchor in the bay. Only steamers of light draft, and ships drawing not more than 9 feet can get up to Bilbao, and even then they lay aground at low water. The British Consul at Bilbao writes, in 1877, that the necessity cannot be too strongly impressed of not loading vessels beyond a draft which ordinary conditions of the bar permit, and, after long experience, this may be confidently stated should not exceed 12 to 12½ feet." Further, you state, "All of the immense remainder, 3,692,484 tons, was shipped to foreign countries, such as Great Britain, France, Germany, Belgium and the United States," indirectly implying that the United States compares equally with the other countries named, while the maximum amount imported into the United States from Bilbao during 1882 was about 2000 tons to Philadelphia, 2350 tons to Baltimore and 13,000 tons to New York.

As you say, shipments from Bilbao are almost entirely made by means of (English and Spanish) steamers, built exclusively for the trade, of shallow draft and great breadth, rendering them unfit to attempt a voyage across the Atlantic with a cargo of iron ore, but admirably adapted for the Bilbao trade with Great Britain and the Continent. From the frequent reference to the shipments of ore at Bilbao, both in Congress and in the papers, people are apt to get an impression that the enormous trade of this place is likely to overflood and ruin ore companies in the United States, whereas the shipments this way compared with those to other countries are as 1 is to 100, and from the natural obstacles in the way there is little likelihood of the situation being changed.

Yours truly,
EDMUND D. SMITH.

Tariff Discussion.

To the Editor of The Iron Age.—SIR: The protracted discussion of the tariff by Congress has been carried on more with reference to political effect than from a regard to the real interests of the country, and has shown the natural ignorance of the average Congressman and his inability to learn. Indeed, so anxious were our statesmen to display their demagogism before the public that the Senate could not wait for the action of the House, but must try their skill in tinkering at the tariff, well knowing that it was a mere waste of words, being contrary to law and usage. A curious feature of the discussion is that the report of the Tariff Commission and evidence taken by them are seldom, if ever, referred to, probably because the testimony is beyond the comprehension of the ordinary Congressman. The weakness of the report of the Commission is due to the fact that it was not based upon the evidence taken, but admittedly a mere concession to the clamor of a few Eastern newspapers and their own notions of temporary expediency. The evidence taken by the Commission, properly digested and applied, will be the true foundation for future legislation, as it was well taken, and gives such a compendium of the agricultural and industrial interests of the country as will not be accessible again before the next census. Hereafter the same information can and should be obtained in connection with the census.

The agitation of the tariff has clearly shown that, while many members nominally pretend to be devoted to "tariff for revenue," they are always ready enough to support protective duties on products in which they or their constituents may be interested. The present Congress seems to be divided as follows: Free trade and direct taxes, none; revenue tariff, 10 per cent.; protection on their own products only, 50 per cent.; general protection, 40 per cent.

The evident weakness is from those protectionists who demand extreme rates for themselves, but are unwilling to grant an adequate proportion of protection to those from whom they purchase their supplies. The action of such people casts the greatest discredit on the whole system. This class are most highly protected of all, and, strange as it may seem, comprise the wealthiest manufacturers of the North and the majority of producers in the South who need protection. These Southern gentlemen, who declaim so constantly against the duties on products in the North, forget that they are protected more highly than those whom they attack. The average duty on rice is 100 per cent.; on raw tobacco, 250 per cent.—proposed to be raised to 500 per cent.—and grain whisky, 500 per cent. Whisky and tobacco are vicious luxuries and fit subjects for revenue only. They are not entitled to any protection, but should have the same rates of duty wherever produced, at home or abroad. The whole object should be to raise the greatest revenue possible on these articles as necessary evils. But let an attack be made on either of them and see how quick every statesman at Washington is aroused. These articles being familiar subjects with him, he can discuss them with all his intelligence and ability.

The proper method of dealing with the selfish class of protectionists would be by the *lex talionis*, or the application of a counter-irritant. Instead of the "You tickle me, I tickle you" way, it is time to try retaliation by refusing to grant protection to those unwilling to return the compliment. The great majority of Congressmen claim to be advocates of a duty sufficient to equalize the conditions of labor here and abroad, and it is probable that a judicious bill based on the proportion and price of labor involved could be passed in the next Congress. So far as the present is concerned, it is the duty of American manufacturers to see that the tariff laws as they are be properly enforced. They are not entitled to new legislation until they have thoroughly tested the old. Any new law would be liable to just as much misconstruction and evasion under the same control. If importers are to control the Treasury officials and make their own valuations, as has been proved so largely by the evidence before the Tariff Commission, no efficient protective law can be passed. In the case of ad valorem duties all valuations should be made at the port of entry, based upon market values in this country, and not on consular invoices. This has been advocated by some of the ablest of our custom officials. This matter of undervaluation is even carried into specific duties by allowance for depreciation of quality. The only way is to keep a sufficient watch over the custom officials to prevent cheating and to protect the honest importer as well as the manufacturer. The effect of erroneous Treasury decisions and fraudulent invoices is shown in the increase of imports of articles particularly affected:

	1881.	1882.	Increase.
Total duties collected	$193 810,000	216 138,000	22,738,000
Silk collected	$19,038,000	22,631,000	3,525,000
Steel collected	9,347,000	12,744,000	3,397,000
Nearly one-third total increase			$6,992,000

The increase in steel is mostly on ad valorem items.

The present tariff laws, efficently executed, with valuations at port of entry, would be far preferable to any of the proposed revisions by Tariff Commission, Ways and Means Committee or Senate bill, and, if the laws are not enforced, no legislation can be of any advantage.

A PROTECTIONIST ON PRINCIPLE.

Shipyard for Commander Gorringe.

The reported lease of the ship-building yard of the Philadelphia and Reading Railroad Co., at Philadelphia, by Mr. Gorringe, late of U. S. N., as representative of New York capitalists, has been confirmed. He has secured considerable capital, and is now soliciting orders for shipbuilding. The yard is a very large one, fully provided with facilities, but it has never been used by the Reading. It was completed several years ago, and was to be used in connection with a line to Europe which the Reading was talking of building. The financial troubles of the company coming upon them, the scheme was abandoned and the yard was never utilized.

Mr. Wm. H. Vanderbilt is supposed to have an indirect interest in the new enterprise. An iron sailing ship for the Oregon Railway and Navigation Co. will be commenced immediately. Mr. Gorringe is confident of doing a profitable business. In an interview a few days ago he said: "I am personally in favor of the admission of foreign-built ships to registry upon the payment of duty equivalent to that on the material used in their construction. Any Congress which passed a free-shipping act and did not make this one of its provisions would be going directly against the interests of American labor, and I do not not believe that any Congress would dare to pass such a law. It is a well-known fact that our mechanics do more work and produce more in a given time than the English mechanics do, and, besides this, we are famous the world over for our labor-saving machinery. Under these circumstances I can see no difficulty in our building ships, even under the present laws in regard to the tariff, at such reasonable prices as will encourage their purchase. We do not propose to run ships of our own. All that we are going to do is to build ships for those who want them, and I know from my own experience that the demand for coasting vessels is very great and steadily increasing. I propose now to devote my entire life to shipbuilding. I have been a patient student of the art of building ships in all its branches for the last 20 years, and I am just about to realize my dreams. We shall always recommend iron vessels to our customers in preference to wooden ones, but we shall have all facilities for building the most improved form of wooden ships. It is very evident that iron steamers must replace the wooden sailing tonnage of the United States, on the score of economy and profit."

British Iron Trade Association.

The following return has just been issued by Mr. Jeans, secretary of the association:

Statistics of the Production of Pig Iron for the Year ending December 31, 1882.

PRODUCTION OF PIG IRON.

	June 30. Tons.	Dec. 31. Tons.	Total. Tons.
Cleveland	1,332,543	1,356,107	2,688,650
Scotland	556,000*	569,400	1,126,000
West Cumberland	472,038	529,143	1,001,181
South Wales	476,516	406,769	883,305
North Wales	25,672	23,041	48,713
South Staffordshire	190,442	208,001	398,443
North Staffordshire	157,386	159,731	317,117
Lincolnshire	102,861	98,700	201,561
Lancashire	392,663	390,072	782,719
Northamptonshire	90,475	101,640	192,115
West and South Yorkshire	151,096	128,157	279,253
Derbyshire and Notts	228,653	217,082	445,715
Shropshire	39,275	41,200	80,475
Gloucestershire, Wiltshire, &c.	25,000	23,000	48,000
Totals	4,241,245	4,252,042	8,493,287

* Estimated.

Net increase on 1881, 117,922 tons.

Stocks of Pig Iron held by Makers and in Warrant Stores in the United Kingdom on December 31, 1882, with Increase or Decrease as Compared with December 31, 1881.

	Dec. 31, 1882. Tons.	Dec. 31, 1881. Tons.	Inc. or Decrease. Tons.
Cleveland	266,179	378,170	Dec. 111,991
Scotland	836,000	940,000	Dec. 104,000
West Cumberland	101,356	68,051	Inc.. 33,305
South Wales	78,519	53,238	Inc.. 25,281
North Wales	3,740	10,740	Dec. 7,000
South Staffordshire	38,802	46,500	Dec. 7,691
North Staffordshire	47,523	28,707	Inc.. 18,816
Lincolnshire	8,200	23,844	Dec. 15,544
Lancashire	60,218	57,836	Inc.. 2,382
Northamptonshire	18,720	14,915	Inc.. 3,805
W. and S. Yorkshire	54,180	49,070	Inc.. 5,110
Derbyshire and Notts.	37,757	26,686	Inc.. 11,071
Shrop hire	21,500	34,005	Dec. 12,505
Gloucestershire and Wiltshire	4,200	4,500	Dec. 300
Totals	1,576,894	1,736,262	

Net decrease, 159,368 tons.

The stocks of pig iron on December 31, 1881, amounted to	1,736,262
The production of pig iron in 1882 was	8,493,287
Total	10,229,549
Deduct stocks on December 31, 1882	1,576,894
Total consumption of pig iron in 1882	8,652 655
As against a consumption in 1881 of	8,182,513
Being an increase of	470,142

Note.—The stocks on December 31, 1882, are equal to 18.2 per cent., or 9.4 weeks of the consumption of that year, as against 21 per cent., or 11 weeks of the consumption of 1881, represented by the stocks on December 31 of that year.

An experiment has recently been tried by William Jessup & Sons, of Sheffield, which promises to be exceedingly interesting. They have made a solid cast-steel rudder for an ocean steamship and submitted it to some tests which were extraordinarily severe. The casting was 5 feet 3 inches wide by about 27 feet long. The rudder is ½ inch thick on the outer or rear edge, 2½ inches thick just outside of the pintle, and 4¼ inches thick at the pintles themselves. The area of the rudder was about 57 square feet, and it was tested in a most severe manner under the direction of the underwriters' surveyor. The reports which have come to hand say that the test was most satisfactorily sustained, and we judge that they imitated in a very perfect manner the effect of a heavy sea striking against the rudder.

AMERICAN INSTITUTE OF MINING ENGINEERS.

BOSTON MEETING.

The annual meeting of the American Institute of Mining Engineers was held last week in the city of Boston, the opening session taking place on February 20th, in the large dining hall of the Hotel Brunswick. The meeting was well attended, and the arrivals of the following day added many more members and their ladies to those already present. The meeting extended over the 20th, 21st, 22d and 23d of February, and the following programme, laid out by the Local Committee of Arrangements, of which Gen. F. A. Walker was president, and Prof. R. H. Richards, of the Institute of Technology, secretary, was closely adhered to.

PROGRAMME OF THE BOSTON MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

Tuesday, February 20.

8 p. m.—Opening meeting and address of welcome to the Institute by Mr. Edward Atkinson. Address in behalf of the Boston Society of Civil Engineers, by Mr. Thomas Doane. Reading and discussion of papers.

Wednesday, February 21.

9 a. m.—Session in Room 4, Massachusetts Institute of Technology.

1 p. m.—Excursion by omnibus, starting from Hotel Brunswick, to visit the Leavitt sewage pumping engine, the Carson sewer excavating apparatus and the Norway Iron Works.

7.30 p. m.—Session in Room 3, Massschusetts Institute of Technology.

Thursday, February 22.

8.30 a. m.—Excursion to visit the testing machine at Watertown Arsenal.

11.20 a. m.—Leave Watertown for Cambridge.

12 m.—Visit the buildings of Harvard University in the following order: Harvard Hall, the Harvard College Library, Hemenway Gymnasium, Physical Laboratory in Lawrence Scientific School, Museum of Comparative Zoölogy.

2 p. m.—Lunch in Memorial Hall.

3 p. m.—Visit Boylston Hall, the Chemical Laboratory and Mineral Collection.

3.30 p. m.—Session in the Chemical Lecture-room, No. 9 Boylston Hall.

5 p. m.—Leave by omnibus for Hotel Brunswick.

8 p. m.—Subscription dinner.

Friday, February 23.

9 a. m.—Session in Room 4, Massachusetts Institute of Technology.

11 a. m.—Leave Lowell railroad station on excursion for Lowell. Lunch on arrival. Visit to water-power and mills. Trains return at 4.30, 5.25, 5.40, 6.20 p. m., arriving in Boston about one hour later.

The excursions were open to members of the Institute of Mining Engineers, of the Boston Society of Civil Engineers and of the local committee, and also to members of their families.

The proceedings opened with an address of welcome, delivered by Mr. Edward Atkinson, the President of the Boston Manufacturers' Mutual Fire Insurance Company, of Boston, who is also identified with many Eastern manufacturing interests. Mr. Atkinson, after declaiming all knowledge of mining, proceeded to give a very able demonstration of the close relations existing between agriculture, mining and metallurgical interests. He then reviewed the history of Massachusetts as a metal-producing State, referring to the manufacture of iron from bog ores at Saugus and Braintree as among the earliest efforts of Americans to utilize their mineral deposits. He called attention to the fact that the dies from which the pine-tree shillings were coined were of home manufacture, and reminded his hearers that the descendants of Revere, the coppersmith, had built up a copper industry in Boston Harbor, which remained eminent until ruined by the statute laws of protection. From this point on Mr. Atkinson gave the reins to his hobby-steed. He called attention to the natural resources of this country, its extensive and valuable coal and ore beds, and then argued, with more enthusiasm than logic, how, notwithstanding these great advantages, notwithstanding the skill of our engineers and the superiority of our mechanics, our protective laws placed us steadily at greater and greater disadvantages, and served only in reality to protect the machine shops and shipyards of Great Britain. He protested earnestly against the fallacy of the argument that pauper labor was cheap labor, and contended that the opening of our ports to the nations of the world would not tend to a reduction of wages in this country, but, on the contrary, lead to the raising of wages abroad and the mental elevation of the foreign mechanic. How this result was to be brought about was not quite clearly explained by Mr. Atkinson, his premises and conclusions getting at this point slightly mixed. He next pointed out how, with the opening of new mineral resources in the West, the East found greater and greater difficulties in maintaining its industrial position, and so it was that "Massachusetts grows poorer and poorer every day"—all through the tariff laws. Never was there Jeremiah more prophetic of evil, and Marius sorrowing over the ruins of Carthage was a picture of jollity as compared with Mr. Atkinson when describing in vivid word-painting the approaching ruin of Boston, so that when in his peroration he extended a most cordial welcome to the members of the Institute, and tendered them "the freedom of our ancient city," there was just a slight disappointment at the lack of logic which had failed to add, "or, rather, what is left of it."

Mr. Atkinson was followed by Mr. Thos. Doane, president of the Boston Society of Civil Engineers, who welcomed the Institute on behalf of his society in a very humorous speech, full of happy conceits, dealing with the analogies and differences of the two branches of engineering. In conclusion, Mr. Doane added to Mr. Atkinson's tender of the freedom of the ruined city the proffer of 91 gallons of water—"said to be pure"—

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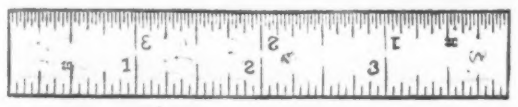

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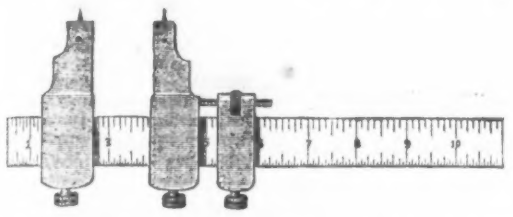

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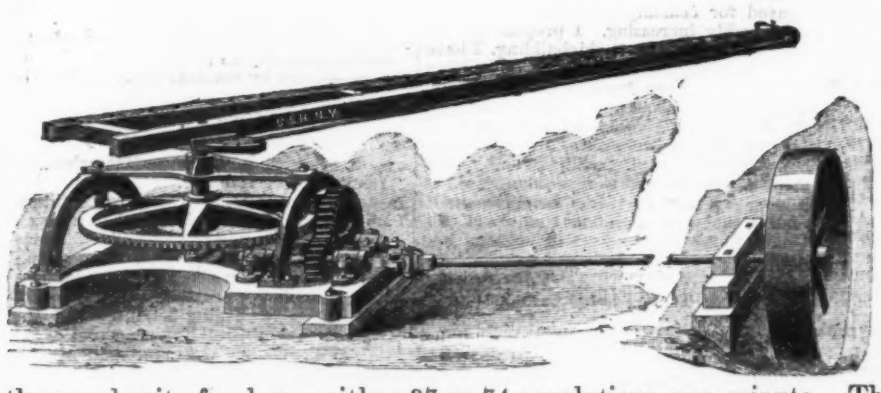

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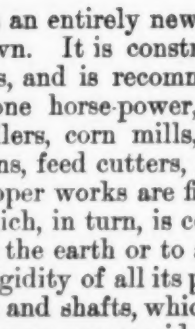

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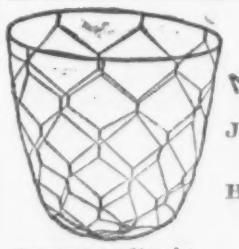

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to each member for every day of their stay, on behalf of the city, and on his own behalf presented to the Institute, to be preserved in its archives, the source of his humorous inspiration—"The Book of Riddles," "One Thousand Riddles and Their Solutions," &c.

President Rothwell, after acknowledging in a few well-chosen words Mr. Atkinson's sorrowful welcome and Mr. Doane's reckless liberality, formally opened the session by calling upon Mr. James C. Bayles for the first paper of the session, "The Microscopic Analysis of the Structure of Iron and Steel," which we give in full in another part of this issue.

The next paper of the session was read by Dr. T. Sterry Hunt, of Montreal, on "Coal and Iron of Alabama," which we trust to lay before our readers in an early issue. After pointing out in a short review the salient geological features of Alabama in general, and of the coal region of Central Alabama in particular, he referred to the intimate relations existing between the geological and economic interests of the region, and expressed his conviction of the certainty of a great future for the State, not only in coal mining, but also as an iron producer. Doctor Hunt referred also to the earlier work in the same field by President Rothwell, who, in his turn, in the discussion of the paper, called attention to the eminent services of Mr. Joseph Squire, of Helena, the pioneer of that section, in studying and developing its mineral deposits.

After the election of a large number of members and associates, the meeting adjourned to meet at 9 a. m. the following day, February 21, at the Institute of Technology.

Second Session.

The papers read at this session comprised one by Prof. R. H. Richards on the "Peculiarities of Block Tin Obtained by Smelting the Residuum After Distilling the Amalgam." This was followed by Mr. H. W. Howe on "A Suggested Cure for Blast Furnace Chills," which excited a quite lively discussion, in which Messrs. Mattes, Constable, Rothwell and Raymond participated. The next paper read was by Prof. W. G. Blake, of New Haven, on the "Metallurgy of Nickel in the United States," who, in turn, was followed by Mr. A. S. Bower, of St. Neots, England, who, after being introduced by Mr. G. W. Maynard, of New York, read a paper on the "Bower-Barff Process," a full account of which will shortly appear in these columns

In the afternoon carriages were taken and a visit of inspection was made to the pumping station of the new sewage system at Old Harbor Point. Here the powerful steam pumps of the Leavitt manufacture were set in motion and operated in the presence of the visitors in the pumping of sea water. The engines are compound vertical, having the steam cylinders placed above the two pumps, the connecting-rods of the engines being attached to a walking-beam, which is connected with the fly-wheel. The high-pressure cylinder is 25½ inches in diameter and has a 9-foot stroke, while the diameter of the low pressure engine is 52 inches. The steam is carried to the high-pressure cylinder by a 10-inch supply pipe, the engine being designed to work with an initial pressure of 100 pounds, cutting off at about 22 per cent. of the stroke. In passing from the high-pressure to the low-pressure engines, the steam flows by 960 ⅝-inch brass tubes, through which live steam circulates. By this means, which Mr. Leavitt has also used in the famous "Superior" engine at the Calumet and Hecla mine, any moisture in the steam caused by the expansion in the high-pressure cylinder is removed and the steam is dried. It enters the low-pressure cylinder at a pressure ranging between 20 and 25 pounds, and is cut off at about one-half of the stroke. The automatic governor, which is of a design patented by Mr. Leavitt, is controlled by a governor which can be run at any speed. The fly-wheel is 36 feet in diameter and weighs 36 tons. Steam is supplied by four steel boilers rated at 250 horse-power each, built by Kendall & Roberts. Every steel plate used was tested, the specifications being an elastic limit of 37,000 pounds, and ultimate strength not more than 65,000 pounds nor less than 60,000 pounds, and an elongation of not more than 20 per cent. nor less than 10 per cent. The boilers are 80 inches in diameter, of 7-16-inch double riveted steel, the fire-box being made of 5-16-inch steel. They have 132 3-inch tubes 15 feet long. The feed-water is heated by the waste gases in a heater containing 1000 feet of 2-inch brass pipe, the average temperature of the feed being carried up to 180° F. The boilers, of which there are four, are covered with a mixture of one part plaster of Paris and two parts of sawdust held in place by straps. The pumps have 48-inch plungers and specially designed rubber valves with metal backing, having a high lift in order to allow the passage of large substances that are liable to get into the sewage. The bottom of the sewer is 14 feet below low water, and the maximum lift is 43 feet. It is not expected, however, that the average lift will exceed 37 feet. The nominal speed of the engines is 11 revolutions per minute, and at that speed delivers 25,000,000 gallons. At the time of the visit of the Institute, the one engine was running at 16 revolutions and was delivering at the rate of 36,000,000 gallons. The engine had not, since put up, run more than 24 hours all told, and was not at its best. They were built by the Quintard Iron Works of this city.

Next a visit was paid to the Norway Iron Works, where the use of vapor fuel in several of the furnaces attracted a great deal of attention. After experimenting for several years with this device, and after many changes in the details of the plant, the managers of the works believe that they have now succeeded in rendering it preferable to the usual system of heating with gaseous or solid fuel. The vapor used is that of petroleum, and the operation as follows, viz.: The petroleum is forced by a small pump into a cast-iron tank, which contains a receptacle to which a large surface has been given by alternate contraction and swelling of the section by deep corrugation. Upon the surface of this interior receptacle the petroleum drops in a small stream. Through the interior of the corrugated receptacle passes live steam, which issues from an orifice in the bottom in a superheated condition, mixing with the vaporized oil. The entire cylindrical tank is heated by a special fireplace, and the mixture of superheated steam and vaporized petroleum is directly carried by pipes to the furnaces where it is used. It is stated that no trouble is experienced by the formation of the solid, firm coke which has wrecked so many kindred devices. Oil as a fuel has just been introduced in these works to run a scrap-heating furnace, in which the two-ton charges are put through in 25 or 30 minutes. This heating furnace has regenerators at both ends, and the work it does, so far as can be gathered from its short run, is pronounced satisfactory. Near this reheating is a double puddling furnace, also heated with oil, it having a capacity of from 12,000 to 15,000 pounds of pig, from four to five heats being got out of the furnace per ten-hour shift, or more than two single ordinary puddling furnaces near by with a capacity of from 475 to 500 pounds of pig each. It should be stated that all of these furnaces are worked more for high quality than large production. A third furnace heated with oil is used for reheating open-hearth steel ingots. It is not provided with regenerators, the heat being utilized for making steam in a boiler overhead. For this purpose, too, the oil heating appears to give satisfaction.

The steel mill of the Norway Iron Works contains what is said to be one of the most successful open-hearth plants in the country, each of the three 10-ton furnaces averaging from 20 to 22 heats per week. Much attention appears to be paid to the careful pre-heating of the scrap used, a small heating furnace serving the line of three steel furnaces. Another feature of interest in connection with them is the casting arrangement. The steel is run into a ladle mounted on a swinging crane, and in order to do the casting as rapidly as possible, and yet as quietly as practicable, the ingots, placed in a small pot, are grouped in nests of four and six. On top of each of the nests is placed a tank, into which the steel is passed, and from which it flows simultaneously into all of the ingots through four and six orifices respectively in the bottom of the tanks. The bulk of the steel made appears to be used for boiler plate. The ingots are rolled down to slabs in 12 passes in a two-high train, the slabs going to the Bay State Iron Co. for further working. For various shapes the steel is rolled in a three-high train down to 6 inches square. The mill has, besides two trains for wire rods and small shapes, one train for carriage springs, one 10-inch train for shapes, a 13-inch train for spring steel of various shapes, three 18-inch trains for shapes and steel billets and a sheet mill.

One of the most interesting departments of these works is the one in charge of Mr. J. H. Billings, the inventor of the cold-drawing process. Here steel of various sizes and shapes is drawn cold through dies. At the time of the visit of the Institute a 2½-inch round steel rod was being drawn and reduced 1-16th inch, coming out of the die far more perfect than lathe work would have rendered it. Besides rounds, there are also square and flat bars drawn, which are largely used by many New England machine builders. We shall refer to this process more fully in some future issue.

From the Norway Iron Works a visit was paid to the Carson process of sewer excavation, once so curious, but now so familiar to Boston people. The point visited was at Atlantic avenue, where one of the intercepting sewers of the new system is being laid. The process is that by which the earth is excavated to the proper depth slightly in advance of the workmen who are constructing the sewer, and, as excavated, is lifted in buckets above the street level, and thence is conveyed, by means of an overhead rail and running gear, so far back that the buckets may be swung and their contents emptied upon the completed arch of the sewer.

Third Session.

The third business session was held in Room 4 of the Institute of Technology. Papers were read as follows: "The Collection of Flue Dust at Ems," by Dr. T. Egleston, of New York City; "The Shop Treatment of Structural Steels," by A. F. Hill, of New York City; "The Geological Relations of the Topography of the South Appalachian Plateau," by Prof. W. C. Kerr; "Lines of Weakness in Cylinders," by Prof. R. H. Richards, of Boston. The latter, by a series of experiments in the hall with heated glass cylinders, showed that the strain brought by an explosive pressure within any cylinder, of whatever material, tends to open rifts in line with the axis of the cylinder, and not transversely. This law of explosive force he held to be applicable in the prevention of steam-boiler explosions.

Professor Egleston's paper on "The Collection of Flue Dust at Ems" was discussed by Mr. Rothwell, who had also lately been at Ems, and the two gentlemen seemed pleased at the opportunity offered to compare notes of travel.

Mr. Hill's paper, which will be given in full in an early issue, on "The Shop Treatment of Structural Steels," was discussed by Robert W. Hunt, of Troy, who suggested further experiments with a step-punch—a slightly exaggerated section of which he outlined in chalk on the blackboard—in order to see if by this mode of punching the necessity for reaming might not be obviated. Mr. John Fritz, of Bethlehem, Pa., discussed the proportions of the punch as outlined by Mr. Hunt. Professor Egleston differed with Mr. Hill on the bad annealing effects of the lead bath, and cited in support of his views the fact that many cutlery manufacturers employed this bath successfully for tempering.

Thursday was chiefly devoted to sight-seeing. Two parties took carriages at different hours of the forenoon and went to the National Arsenal at Watertown to examine and witness experiments with the celebrated testing machine. This apparatus is quite as much appreciated by persons living at remote distances as by those close at hand, and is duly understood and valued by mechanicians, experts and scientific men residing in this vicinity. One of the visitors of yesterday remarked that one of the first questions asked by a French scientist, whom he met abroad, was whether he had seen the Watertown testing machine in operation. Neither the French nor any European

nation has any testing machine of equal capacity and precision of measurement. The examination of the apparatus itself took a considerable share of the time, and but one experiment was made with it while the visitors remained, and that was a test of steel by tension. The piece of steel was a flat bar of the manufacture of the Norway Iron Works, of .12 carbon. It was in length, 80 inches; width, 5.85 inches; thickness, 1 inch. Under tension it stretched 18 inches, and broke when force of 208,300 pounds had been applied, which is 49,282 pounds to the square inch. In the afternoon several of the buildings of Havard University were visited, including the Museum of Comparative Zoology, the Peabody Museum, the Gymnasium, and the Chemical Laboratory and Museum of Minerals in Boylston Hall. A lunch was served in Memorial Hall, after which the Institute held a session in the lecture room of Boylston Hall. The only paper submitted was that of Professor Sharples, of the Institute of Technology, on "The Strength of American Woods." He gave an account of a long series of experiments made to test the value of various woods for purposes of construction in respect to strength and for purposes of fuel. The tests were applied to 1300 different specimens, of 400 different species, all of native growth in the United States.

Before the close of the session Professor Cook, of Harvard University, showed in a beautiful manner the "critical point" observed in heated liquid carbonic acid at a blood temperature. The carbonic acid was seen to expand rapidly as heat was applied, the surface of the liquid gradually becoming indistinct and nebulous, and finally being impossible to trace. This was shown on an illuminated screen, the liquid being in a vial in front of the concentrated light.

In the evening at 8 o'clock the members of the Institute and guests, among whom were many ladies, partook of an elegant banquet at the Hotel Brunswick. A feature of the dinner and a certificate of excellence that cannot often be cited for dinners where a large company is gathered, was the fact that every guest sat till the last of the after-dinner speeches was made, or till somewhat past the midnight hour. For two hours and a half eloquence and wit flowed uninterruptedly. The chairman of the evening, Dr. R. W. Raymond, presided in quite the ideal way, and the guests soon came to watch quite as eagerly for what was to be said by way of interlude as what was forthcoming from each successive speaker. The speakers who immediately followed the opening by the president were Professor Jackson, of Harvard University; Professor Lanza, of the Institute of Technology; Major Charles W. Raymond, of the Corps of Engineers of the regular army, and Captain John G. Butler, of the Ordnance Corps, stationed at the Watertown Arsenal. Before presenting the next speaker, the chairman told the story of a Western restaurant, the signboard of which announced that for a "square meal" the price was 50 cents. and for a "perfect gorge" $1. The speeches already made by the local talent, he said, constituted a square meal. His prognostic of what was to follow was quite justified, and it was perhaps fortunate that the elequent gentleman from Virginia who had been expected, Major Jed Hotchkiss, did not arrive. The speakers were John H. Ricketson, of Pittsburgh, Pa.; Dr. Persifer Fraser, of Philadelphia; Dr. T. M. Drown, of Easton, Pa., and J. C. Bayles, of New York, and the chairman brought the festival to a close by reading some original and smoothly flowing verses complimentary to the ladies.

Fourth Session.

The final session of the Institute was held on the morning of the 23d of February, again at the Institute of Technology. The secretary's report showed the receipts for the year to be $13,169.05 and the expenditures $8240.53. During the year 215 members and 16 associate members were elected, the total membership now being 1213. The following officers were elected: President, Robert M. Hunt, of Troy; vice-presidents, two years, S. F. Emmons, of Denver; W. C. Kerr, of Washington; S. F. Wellman, of Cleveland; managers, three years, John Birkinbine, of Philadelphia; Stuart M. Buck, of Coalburg, W. Va.; E. S. Moffatt, of Scranton; treasurer, Theodore D. Rand, of Philadelphia; secretary, Thomas M. Drown, of Easton, Pa. A paper entitled "Eozoic and Lower Paleozoic in South Wales and their Comparison with their Appalachian Analogues," was read by Prof. Persifer Frazer, of Philadelphia, and Dr. Hunt spoke on the same subject. As the paper seemed to really have no other purpose than the settlement of a personal difference of opinions on the subject between these two gentlemen, who alone took part in its discussion, we shall abstain from laying before our readers either paper or discussion. Business of a routine character was then transacted and the meeting adjourned. After adjournment about 70 members availed themselves of an invitation by Mr. Francess to inspect the manufacturing establishments of Lowell, the famous Lowell water-works and to partake of the charming hospitality of his home.

Taken all in all, the meeting was unanimously voted a complete success. Too much praise cannot be bestowed upon the perfection of the arrangements made by the local committee, conspicuous among whom was Prof. R. H. Richards, of the Institute of Technology, who was both indefatigable and ubiquitous in his attentions to the members and their ladies, all of whom cannot but gratefully remember his untiring solicitude for their comfort.

During the year 1882 the number of passengers from foreign ports that arrived at the port of New York was 520,355, of whom 476,086 were aliens and 44,269 were citizens of the United States, or had previously visited this country. The number arriving in 1882 exceeded the immigration of 1881 by 70,717, and is the largest of any one year since the establishment of the commission. The nationalities of the alien passengers were as follows: Germany, 198,468; Sweden, 42,517; Ireland, 52,768; England, 40,849; Norway, 15,147; Switzerland, 12,068; Bohemia, 7179; Scotland, 13,557; Russia, 15,900; Hungary, 11,944; Denmark, 12,834; Netherlands, 7078; France, 4667; Wales, 4451; Austria, 2707. Of the above number, 166,824 are credited to the State of New York, but as these figures include many who remain but a short time in the city and then proceed to other States, it is manifestly no criterion of the actual share of New York State in the immigration of the year. The immigration of Germans and Scandinavians has largely increased during 1882 over that of former years.

Microscopic Analysis of the Structures of Iron and Steel.*

That so little, comparatively, is known of the nature and phenomena of metals and alloys is not surprising, considering how slowly we learn to study them with thoroughness and accuracy. Nor is it surprising that we learn to study them slowly, when we remember that the most searching analysis and most thorough test stops far short of the complete truth, and that, push our investigations as far as we may, "the utmost still is hid."

An obstacle to the more careful and satisfactory study of metals has been the difficulty in harmonizing the results of chemical and physical tests. These give us the results of observations made from different and often widely separate points of view, and while it is true that these results give us bases for more or less accurate triangulations into the realm of speculation, it is doubtful if, with only the laboratory and the testing machine, our investigations would not move in parallel lines, leaving between them an unexplored field in which must probably be sought the information which shall connect the results of chemical and physical tests, and give to both a practical value which neither has yet been found to possess.

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Cast Steel, Showing Uniform Structure with no Lines of Weakness.

Armor Plate, Showing Varying Crystals and Lines of Welding, etc.

Cast Iron, Showing Plates of Graphite which Make it Weak.

MICROSCOPIC STUDIES OF IRON AND STEEL, BY DR. H. C. SORBY.

The use of the microscope in the study of metals is not a new thing, but it is only lately that it has begun to attract the attention it merits or to show results of tangible value to the metallurgist. Among recent valuable contributions to the literature of this subject, I have been especially interested in the work of Mr. A. Martens, of Berlin, recorded in a paper contributed to the *Verein zur Befoerderung des Gewerbfleisses*. Some of the results of the investigations of this gentleman are sufficiently remarkable to merit consideration, as indicating the advantages of the microscopical study of the crystalline structure of metals.

Mr. Martens, although acknowledging that so far he has not been able to obtain results which he would consider conclusive, is still confident that microscopical analysis will find a place as a rival of chemical analysis in the investigation of the composition of metals, principally iron and steel. It is doubtful if this opinion will be sustained. Certain peculiarities and characteristics, due especially to the various mechanical operations the material undergoes during the process of manufacture, or to molecular changes due to the manner in which it is strained in performing its functions as part of a mechanical structure, can probably be best and most satisfactorily investigated by means of the microscope; but we can scarcely expect that microscopy will supplant chemistry in determining the composition of metals. The microscope employed by Mr. Martens is of peculiar construction, having two ball-and-socket joints, by which it can be placed in any required position, while the more delicate adjustments are effected by the usual rack and pinion arrangement. The table upon which the microscope is mounted is provided with a large circular opening in which rests a semi-spherical table, the level surface of which serves to hold the object examined. By simply turning this table, the object can easily be brought into any desired position, so as to give the best inclination for light and observation. One of the main points in connection with Mr. Martens' experiments is the preparation of the specimens. He has examined sections of a large number of different specimens, the surfaces having been ground and finely polished, and then treated with acids, so as to clearly develop the crystals and fibers in the metal. In preparing the samples the small apparatus used in grinding lenses for optical instruments is used, such important changes being made as were found necessary. The acid employed in developing the structure of the metal is greatly diluted, since it is found that the longer the time necessary in the process of developing, the more satisfactory the results obtained. For this reason the acid solutions employed by Mr. Martens are in the proportion of about one part of acid to one thousand parts of water. The preparation of the specimens is said to require no great degree of skill, and to be easily carried out in workshops where the few necessary appliances are readily available.

Mr. Martens experimented upon a series of specimens of different materials, including tool steel, spiegeleisen, gray pig iron, plate glass, &c. He obtained as results a series of enlarged views of the fractured surfaces of the bodies in question, which are very interesting. He found that the fractured surfaces of bars which broke under repeated use exhibited distinct features. Clearly defined portions of ellipses could be observed on surfaces of tool steel and plate glass, while within each portion of an ellipse could be seen, under favorable conditions, streaks, the prolongations of which beyond the ellipses ran in directions normal to the bounding surfaces of the broken pieces. This observation could almost always be made in connection with metals exhibiting a fine granular fracture, and the finer the granules, the more distinct were the streaks mentioned. In tool steel these streaks could be seen with remarkable clearness. These remarks apply only within certain limits, and, when these limits are passed, the material exhibits a fracture commonly observed in flint, glass and like substances. But even in fractures of such bodies, surfaces bounded by portions of ellipses and having distinct streaks running in a direction normal to the ellipses may be observed. These normal streaks were found to consist of prismatic elevations which passed through the area inclosed by the ellipse, and were arrested by the outline of the ellipse, which also projected from the common level of the surfaces, coinciding, however, with the latter at the ends.

From his various examinations Mr. Martens concludes that sudden cooling of molten masses of metal favors greater uniformity than slow cooling, this having, in his judgment, been shown very conclusively by a protracted study of different samples of pig iron. He thinks that conclusions as to the use to which pig iron and steel may be put may, in a great number of instances, be based upon examinations of this kind, and that the method will very often be found to be sufficiently trustworthy for all practical purposes.

Another valuable contribution to the literature of this subject was recently made by Dr. H. C. Sorby, of Sheffield, in a lecture on the "Microscopical Structure of Iron and Steel." Doctor Sorby, it appears, was first induced to investigate the subject as bearing on the structure of meteoric iron, and the results which he obtained are certainly of great interest. Doctor Sorby prepared his specimens in a manner described in another portion of this paper, the development of the structure being attained by the use of weak acid. This development is due to the fact that some of the constituents of the specimen are not acted upon at all, and others in varying degrees. Doctor Sorby found that portions of slag or cinder remained in their original state, and were seen as black specks or patches of varying size and shape. Some constituents of iron and steel remain perfectly bright and brilliant, while others became coated, to a varying extent, with a brown film, so as to show the outlines of the individual crystals very perfectly. Other constituents, again, are so acted upon as to develop a very close grooved structure, which gave colors of varying brilliancy. Thus, by difference of color, or other characteristics, the outline of the individual crystals and their own intimate structure are shown to great perfection. Doctor Sorby further states that the thorough determination of the exact nature of all the constituents seen in the various specimens would involve many years of careful chemical and microscopical investigation, since, though many of them differ very greatly in microscopical and physical character, their size is so small that it would be difficult or impossible to separate them in such a manner as to determine their chemical constitution, and it would consequently be requisite to ascertain their true nature by careful induction from facts observed under special circumstances. So far as could be learned with the microscope, Doctor Sorby found various kinds of iron and steel to contain at least seven well-marked constituents. Starting with pure iron, he found what are probably three well-marked compounds of iron, with varying amounts of carbon or other substances met with in small quantities in different sorts of iron and steel, portions of included slag, well-marked crystals of graphite and small crystals that may be silicon. Doctor Sorby exhibited a number of illustrations of the structure of various kinds of iron and steel. Several of these illustrations were kindly furnished me by Doctor Sorby, being heliotypes from photographs obtained directly from the specimens in question. The samples in question comprise armor plates, meteoric iron, cast iron and cast steel, and, as an inspection will show, exhibit a greatly varying structure. The specimen of cast steel is of very uniform structure, with no lines of weakness, while an inspection of the specimen of cast iron will reveal a number of plates of graphite that naturally tend to diminish the strength of the metal. The armor plate, on the other hand, shows varying crystals and lines of welding, while the sample of meteoric iron shows a structure altogether unlike that of any artificial iron.

Dr. Sorby's paper is of such interest that the following abstract taken from a report received some time since will undoubtedly meet with favor: Commencing with various kinds of cast iron, it was shown that their structure was sometimes greatly modified by the presence of crystalline plates of graphite, over which was deposited what was probably free iron, the interspaces being filled by what were considered to be two distinct compounds of iron and carbon. In other cases, the structure was mainly dependent on the crystallization of the iron itself, the graphite being thrown off toward the close of the process. In the case of white refined iron, the principal constituent was probably an intensely hard, white iron, with much carbon, associated with which were one or more of the other compounds of iron and carbon always present in gray iron. Various kinds of wrought iron were next considered. A hammered bloom was shown to consist of an irregular mixture of crystals of iron and portions of slag. When rolled out into a bar, those portions of slag not expelled were thrown out into long threads, and the crystals of iron seen in the bar were not the original crystals of the bloom, but fresh crystals formed in cooling. This conclusion was based upon the fact that they exhibited little or no tendency to elongation in the line of the length of the bar, as they probably would if the original crystals had been drawn out by the process of rolling. The fiber seen on fracturing such specimens of wrought iron was mainly due to the elongation which occurred during the fracture, and was not a characteristic of the iron. In this connection Dr. Sorby exhibited the specimen of armor plate to which I have referred, and all of those kinds of iron that are employed in the manufacture of steel by cementation.

The change of structure produced by this process is very striking, the most characteristic feature being the development of a network of flat crystals of an intensely hard compound of iron and carbon, scarcely acted upon at all by dilute acid, so that the rest of the steel may be dissolved away and the compound in question left in sufficient relief for prints to be taken as from a woodcut. The difference between the structure of the outside of the converted bars, where this hard compound of iron and carbon had been developed, and of the interior of the bar, was shown to be very great, and mainly due to recrystallization of the iron. Ingots of cast steel produced by melting blistered steel had a totally different structure, which depended in the first place on large crystals, and in the second place on the minute microscopical structure of these crystals. The principal difference between the structure of such an ingot and that of hammered bars was that the whole mass was made more uniform and the grain very much finer by hammering. This was still more the case when the hammered steel was hardened, in which case the constituent crystals were so small that it was very difficult to learn much about them by microscopical study. It will be seen by an inspection of the specimen of meteoric iron shown in one of the heliotypes above mentioned that the iron differs considerably from most varieties of commercial iron, and though alloys of iron and nickel of the same composition as meteoric iron were melted and slowly cooled, nothing at all resembling the structure of meteoric iron was obtained. It was found, however, that the closest approach to this structure was in the case of iron that had been kept for a long time at a high temperature, but not actually melted, under which conditions some varieties of iron containing little carbon crystallized in large crystals having some of the principal characteristics of meteoric iron, while iron containing a certain amount of carbon crystallized in a manner imperfectly resembling the crystallization of meteoric iron. In this artificial preparation, however, there was crystallization of varying compounds of iron and nickel, and from these facts Doctor Sorby concludes that meteoric iron probably crystallized very slowly at a temperature below fusion.

From what precedes it will be seen that the results thus far obtained are more interesting than valuable, but the value of any interesting scientific fact depends simply upon how soon we shall have more facts to put with it. Those for whom this subject has interest will derive benefit from studying results reached and the methods followed by Mr. A. F. Hill, of the membership of this Institute, in his investigations of the cause of the fracture of the beam-strap of th steamer Kaaterskill*, and in his discussion of the cause of breakage of the connecting-rod of the chain-cable testing machine at the Washington Navy Yard.† These are investigations of the greatest interest and value, conducted with much care, and pointing to conclusions which could not have been reached by analysis or test. In fact, either or both of these methods in the cases named would probably have led to erroneous conclusions.

The conditions of success in the employment of the microscope in the examination of iron and steel are:

1. A careful and thorough preparatory training of the eye.
2. Proper preparation of the specimens.
3. Correct choice of instruments, and
4. An inexhaustible fund of patience.

There is no kind of scientific work to which Schelling's maxim, "In order to see aright, we must know what to look for," applies with greater force than to metallurgical microscopy. This soon becomes apparent to the beginner, and is frequently a source of almost complete discouragement. But before the use of a microscope (simple or combined) can serve any useful purpose, the naked eye must be thoroughly familiarized with the characteristic appearances of metals.

Any one without previous practice who tries to promptly decide from outward appearances whether a piece of metal is iron or steel, or even to distinguish positively between wrought iron and cast iron, is tolerably certain to meet with a series of sometimes rather mortifying failures, which will soon induce him to look far longer and more closely at a piece of metal than he ever did before. By much handling of metal, one soon gets at the difference in the feeling to the touch and the difference in the weight, and all those other physical attributes by which the other senses render assistance to the eye. Given, for instance, a couple of round rolled bars of equal diameter and equal length, the one of iron and the other of steel, and an experienced blacksmith will be able to pick out the steel from the iron almost without looking, simply by the difference in the feeling and in the weight—trifling though these differences are—just as a jeweler or cashier at a desk can decide in the dark whether a given piece of metal is gold or silver, by simply feeling of it. But such help to the eye is apt to embarrass rather than facilitate microscopic work, and it is

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* Read before the American Institute of Mining Engineers, February 20th, by J. C. Bayles.

* *The Iron Age*, October 12, 1882, page 1.
† *The Iron Age*, January 4, 1883, page 1

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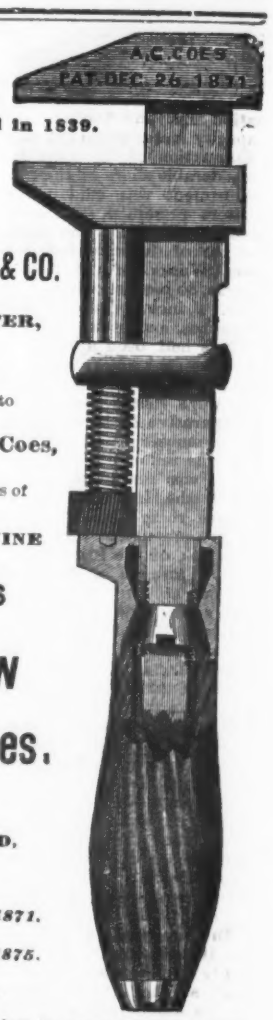

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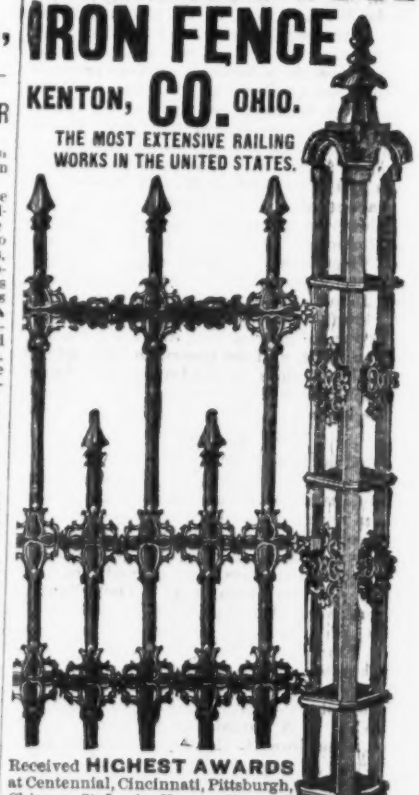

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best to learn early to rely upon the eye alone, without touching the metal.

The first step to be taken in training the eye consists in a careful study of fractures of every description and on every available occasion. Characteristic fractures—that is, fractures of good cast iron, of good wrought iron, of ingot steel, of rolled tool steel—placed side by side, should be studied first, and the obvious differences in their appearance well impressed upon the eye. The recognition of one distinctive feature in each of these four fractures at a first study will be a remarkable progress. Many confound the general impression gained by such a study with a knowledge of distinctive features. The beginner can readily satisfy himself of the value of the knowledge thus gained by comparing the fractures of different metals which are similar in appearance, as, for instance, rolled soft steel and fine wrought iron. The result is likely to be slightly disappointing. After having well impressed upon the eye and memory characteristic differences, he may commence to study the series of characteristic similarities, noting every shade of color—and a very fine study in grade it is—every variation of texture, of form, &c. For whatever is dissimilar among similar characteristics, an explanation should be sought. This is often more easily obtained from the blacksmith than from the man of science. At all events, the blacksmith knows a great deal which is worth finding out. He may be hampered by lack of power of expression and by crude or wrong notions, but if one can draw him out it will be singular if an hour's conversation with him will not amply compensate for the time given to it. After the naked eye has become familiarized with the distinctive features of fractures, the student would do well to go over precisely the same ground, and in the same order, armed with a good hand lens. A power of from two to three linear diameters is amply sufficient for the first studies, but care must be taken that the lens be absolutely achromatic. The first studies will prove revelations. Forms and features never before thought of now become apparent, and with it comes the irresistable desire for a knowledge of the internal structure. This leads to the development of the internal structure by treatment with acid. Sections planed to a well-finished surface answer the purpose at first. If the finish obtained by the cutting tool is not good enough, complete the work by drawfiling in the direction of the fiber. The surface thus obtained may be treated with only slightly diluted nitric acid, but must not be exposed more than a few minutes at a time to the action of the acid, which should be washed off under a running stream of water as soon as the whole surface treated has become oxidized and begins to show brown streaks. Continue this, alternately treating with acid and with cold water, for from half an hour to an hour. In the final washing use a soft jeweler's brush, and satisfy yourself that no acid remains on the surface by testing the water which runs off with litmus paper. Then dry quickly with clean cotton waste. The development thus obtained will naturally be a coarse one, but it has the advantage of bringing out clearly the characteristics of the structure. If the material is fibrous the fiber will show plainly. If the latter has been distorted by mechanical treatment, under the hammer or otherwise, these distortions will show also. If the structure of the material is crystalline, a sort of coarse tracery will develop on the surface resembling, under the magnifying glass, a network of cracks. This sharp acid treatment is rather ephemeral in its results, as with the most careful washing the development obtained will rust out in a short time, but it is, nevertheless, an excellent means of quickly obtaining the characteristics of the internal structure, and of studying and impressing upon the eye and memory its marked features, serving the purpose of a rough contour sketch in the study of a fine or intricate drawing.

For fine developments the conditions of treatment are more tedious and more complicated. In the first place, the surface to be treated must be, as nearly as possible, a true plane. None but the very best planer work and subsequent grinding with either fine emery or under a metallic mirror grinder will answer for this. The surface thus obtained is then treated with highly diluted nitric acid—about 1 part of acid to 300 parts of water—in the following manner: At first, put the acid on with a camel's-hair brush, and as soon as oxidation begins, as shown by the formation of small bubbles on the surface, wipe the specimen dry. Repeat this until all the oil that may adhere to the polished surface has been removed, and the acid is free to act uniformly upon all parts of it. It is of importance that this be carefully observed, or else the acid will attack the metal in spots, and thus destroy the evenness of the surface, which, under a powerful lens, leads to deceptive results, which are rather annoying. A thorough development with such highly diluted acid requires from 24 hours to five or six days, according to the chemical composition of the iron or steel under investigation. The more highly dilute the acid, the longer the time required for the development—but, on the other hand, better results are obtained. After you have assured yourself that the acid does act upon the entire surface, the specimen may be treated by simply immersing it—polished face downward—to a depth of about 1-16th of an inch. To this end the acid is poured in a porcelain or agate-ware tray or "bath," in sufficient quantity to just stand above round glass rods, which are laid in the bottom of the tray, and serve as rests for the specimen, to prevent the surface to be treated from coming in contact with the bottom. The acid should be changed at least every 12 hours, and the specimen washed off with a soft jeweler's brush in clean cold water. After washing, examine the development under water, so as to prevent oxidation, and, when it is complete, wash off all acid thoroughly until the water running off will not affect litmus paper, then wipe thoroughly dry, with cotton waste at first, and finally with a soft chamois skin. A drop or two of kerosene oil rubbed over the surface with the chamois skin will preserve it from oxidation for a long while. But should it take place before the examination of the specimen is finished, or before a good photograph of it can be obtained, the whole surface must be treated all over again.

The foregoing applies only to large surfaces of, say, several square inches. If the development brings out crystal sections, or if it is desired to examine the crystals or the structure of a fracture under a powerful magnification, then the specimen must be prepared for the microscopic slide. This is done in the following manner: A very thin section of the part of the surface to be examined is obtained by planing down from the back to a thickness of 1-32d to 1-16th of an inch. The planed back is then fastened with cement to a glass slip, and the surface to be examined is filed flat, and afterward ground to a perfectly even surface on a fine whetstone, without any tearing or burnishing. Care must be taken to give this surface, in the final finish, so delicate a polish that it shall leave even the most minute particles of metal undisturbed and free from polished grooves or scratches. This carefully prepared surface is then treated with highly dilute nitric acid, and the action of the acid closely watched. After being in the acid for a short time it is taken out and examined under water as before explained. When the etching is thought to be sufficient for obtaining satisfactory results (and this is entirely a matter of practice), the specimen is thoroughly washed, quickly dried, and a thin glass square or circle mounted over it with Canada balsam. The specimen is now ready for microscopic examination.

As was said before, the simple microscope is the proper instrument for the beginner in this kind of work. It is a common mistake with novices to judge the excellence of a microscope by the amount of its magnifying power. The fact is that no object should be viewed with a power greater than is needed to clearly show its structure, and if this can be done with 20 diameters, it is folly to use a hundred. Moreover, the gradual increase of power applied in the study of internal structures has the advantage of giving the student an opportunity to familiarize himself with the results obtained with the lower powers, and thus to find readily those more minute developments which the appplication of the higher powers reveals.

After becoming familiar with the use of the simple microscope, and the developments suited to its powers, work may be begun with the compound instrument. It must be borne in mind that in low-priced instruments the actual and angular apertures of the objectives are small, the corrections not so exact as in those of higher grade, and that they are therefore liable to give false impressions of the object under examination; besides, it is impossible to view an opaque object by reflected light satisfactorily with any of the cheapest forms of compound microscopes, since the lenses approach the object too nearly, and are far too small to admit of a proper illumination of the object.

In making the selection of a microscope, the following points are important to bear in mind:

First. It is essential that the lenses should give good definition—*i. e.*, should show objects clearly and well defined.

Second. The stand should be of good material and workmanship; there should be no "shake" or lateral motion in the adjustments for focus; there should be no "lost motion"—that is, the focus should be instantly changed by the slightest motion of the milled heads—and for metallurgical work, which deals with opaque objects only, there should be a universal joint for inclination, which will be found a great convenience in observation. For beginners, one of the best practical treatises on the subject is Dr. Phin's "Hints on the Selection and Use of the Microscope." For further details regarding the preparation of slides the student would do well to consult any of the numerous hand-books on the subject, one of the best of which is Thomas Davies' "The Preparation and Mounting of Microscopic Objects." One thing, however, should not be lost sight of, and that is, that besides delicacy of touch and infinite patience, the most exquisite cleanliness is an indispensable condition of success. Dust and moisture are the microscopist's worst foes.

Concerning the results to be expected from the microscopic analysis of metals it would, at this stage, be judicious to speak with caution. I believe it opens a vast and as yet unexplored field, especially in connection with materials of construction such as iron and steel. The progress of the past 20 years in the methods of making and testing these metals has revealed the close relations existing between their chemical composition and physical properties. There remain, however, many gaps in our knowledge of these materials, largely the result of changes produced by mechanical treatment, and for the study of these we are necessarily dependent upon the microscope. This instrument seems to furnish the best means of investigating these peculiar and as yet mysterious structural changes, which are discovered, but not explained, by the testing machine. To these changes are probably ascribable the many surprising discrepancies which occur in the mechanical qualities of material of a given chemical composition, and it is but fair to assume that microscopic examination will greatly diminish the rather liberal use of the word "unaccountable" in those cases. Perhaps one of the first and simplest results to be expected will be the explosion of the theory of cold crystallization of iron under stress, strain, shock or vibration, to which so many hold with such tenacity, and which is assumed to account for fractures showing apparently crystalline structure. Development with acid and subsequent microscopical study, show that well-defined crystals are present in many forms of rolled and hammered iron, and, in fact, that they are only destroyed when the rolling is carried to such an extent as to change the whole structure of the metal, as in plates, sheets and bars of small section. In many other ways, it is probable, the microscope will show that there is nothing so delusive as the crude experience which has been held to prove a great many things at variance not only with the probabilities, but with all the analogies of nature.

It may sound like a misapplication of terms to speak of the anatomy and physiology of iron and steel, and yet the most advanced metallurgists have long felt the want of the kind of knowledge, or rather information, which could properly be classified under these terms. There are many limitations placed upon the work of the chemist, and the results obtained with the testing machine indicate far more, as Dr. Sorby points out, the lines and planes of weakness and the divisions between the constituent crystals than the actual structure of the metal and the co-relations of the crystals. In many cases the faces of fractures are apt to lead to erroneous conclusions as to the composition of the metal or the cause of its failure. But when, instead of the fractured surface, a polished longitudinal or cross-section comes under observation, with the internal structure of the material revealed by careful treatment with acids, the conditions of observation are entirely changed, and by the aid of the microscope we are, as it were, furnished with the missing link in the chain of evidence required for a correct conclusion as to the nature of the material under investigation.

The suggestions of this paper should be received with the understanding that as yet very little has been accomplished in the way of practical microscopic analysis. Much is to be learned in regard to the proper treatment with acids, and many difficulties in the construction of entirely suitable instruments for the purpose have yet to be overcome. Nevertheless, there is no longer any question as to the important place the microscope must hold henceforth in metallurgical inquiries, nor as to the magnificent field it has opened for investigations of an entirely novel character, the results of which cannot but prove of great value to the practical metal worker.

WASHINGTON LETTER.

Tariff Prospects.

(*Special Dispatch to The Iron Age.*)

WASHINGTON, Wednesday Evening, February, 28, 1883.

The prospects for tariff legislation change with every hour. The Reed rule, which provided that the Senate bill could be taken from the Speaker's table for nonconcurrence and reference to a conference committee, was passed Tuesday morning after a hard fight and an attempt on the part of the free trade and revenue reform element to defeat it by breaking a quorum. After some discussion as to the Constitutionality of the Senate's action, the Senate bill and the question as to its Constitutionality were sent to a conference committee. This action of the House showed that there was a fear that the Senate bill might be rushed through the House. The Senate agreed to a conference on Tuesday night, but Wednesday morning some Senators, having learned of the action of the House on Constitutionality, tried to secure reconsideration of the action, and only failed by three votes. However, a resolution declaring it to be the opinion of the Senate that the conference should be full and free, and instructing the Senate conferees if they found that any limitation was placed by the House on the action of its committee, to retire and report that fact to the Senate for its consideration, was adopted without a division. This showed a disposition on the part of the Senate to resent any attempt to raise the question of Constitutionality, and, as the House instructed its conferees to raise and consider this question, it is difficult to see how an agreement can be reached without the House waiving the question. In the House trouble was experienced in getting a committee. Randall was appointed and declined, as did Morrison and Tucker. The committee, as finally constituted, consists of Kelley, McKinley, Haskell, Carlisle and Speer on the part of the House, and Morrill, Sherman, Aldrich, Bayard and Beck on the part of the Senate. To-night the indications are either that there will be a bill fairly satisfactory to all interests, or no bill, with the probabilities in favor of no bill. There is intense feeling on the part of the anti-protectionists that they have been outwitted, and that a bill more favorable to the iron and steel interests than they desired will come out of the conference committee if they do not split on the question of Constitutionality, and, if so, they will do their best to defeat it. If the Senate bill is amended by the conference managers so as to increase the rates on iron, steel and wool, it will meet with persistent objection from the Democrats. On the other hand, if the iron and steel rates are not advanced, the Ohio and Pennsylvania members will probably oppose the bill. As the conference committee will probably readjust rates on the articles named, and as their report cannot be expected much, if any, before Saturday, the probabilities are against any bill. The only hope for a bill is the strong sentiment in the country in many directions in favor of doing something. This may force a bill, but if it does, as stated, it will be one fairly acceptable to all interests.

(*From Our Own Correspondent.*)

WASHINGTON, D. C., Feb. 28, 1883.

THE SENATE BILL IN THE HOUSE.

The Senate bill, after its passage, was promptly engrossed and sent to the House for its consideration. An estimated amount of reduction in revenues effected by this bill is $25,000,000 a year on an average importation.

CAUCUSES ON THE TARIFF.

During the past few days the Republican members of the House of Representatives have been holding caucuses, in hopes of arriving at some understanding on the tariff bill. The most important of these, at which there was a large attendance, failed to effect any very encouraging results. The main difficulty seems to be in uniting the entire Republican vote upon a measure wholly acceptable. There seem to be about 10 or 12 Republicans who do not like the Senate bill for various reasons, and while they do not say precisely upon what ground, still they are not regarded as wholly reliable. That the Senate bill is full of defects, no one can doubt, but if it could be referred to a conference committee there is a chance that it will be adjusted more favorably to the manufacturers. Mr. Haskell, of Kansas, in the caucus referred to some of the defects of the bill in its present shape, and suggested a committee of conference as the only way to remedy it. He also suggested the danger of allowing it to go to committee of the whole, where the free traders would be able to talk against time, and thus prevent action. He also answered by ample authorities the declaration that the passage of a revenue bill was a violation of the prerogatives of the House. The position was taken that, as it came up as an amendment to a House bill, the House disagreeing, it could be voted to a committee of conference. The Speaker, however, did not coincide fully with Mr. Haskell's position, and the supposition was that he would not regard the matter as a question of privilege. There was considerable speaking, but no results on any specific subject. It was asserted by those present that one disclosure made by these speeches was that the Pennsylvania, Ohio and New Jersey Republicans were opposed to the bill in its present form.

AMENDMENT OF THE RULES.

Finally an issue was forced by the presentation of a resolution directing the Committee on Rules to report an amendment to the rules authorizing a majority of the House to send the Senate bill to a conference committee without going to the committee of the whole, and also pledging the Republicans to nonconcur in the Senate amendments when the bill should come up. On the latter proposition those present voted with great unanimity, but on the former this harmony of action was not manifested, being opposed by a syndicate of the larger manufacturing States. It was discovered now that the Speaker and chairman of the Committee on Ways and Means were hostile to the bill. This discovery caused a marked change in the aspect of things. The most earnest advocates of the Senate bill now threw up the sponge and yielded to a motion to adjourn.

THE SENATE BILL NOT ACCEPTABLE.

It was noticeable that the Senate bill in its present shape was objectionable to the men who represented constituencies most largely interested in manufactures. The natural conclusion, therefore, was that the manufacturers, notwithstanding the inconvenience the uncertainty of the question had occasioned, would rather have matters rest as they are than to take the chances of the Senate bill in the short time still at the disposal of Congress.

A FLANK MOVEMENT FEARED.

The Democrats have a programme by which they propose to drive the Republicans to an issue on the question, thinking they can make a point. Judging from the character of the parties interested, it looks very much like a free-trade movement, as Morrison, Carlisle and that class of economists have been working the matter up. The handful of Democrats who will vote with the Republicans on the basis of a moderate reduction have seemed to have no part in the movement. The fact that Beck, of the Senate, who is the most inveterate enemy of the iron interests, was in frequent consultation with these parties, gave credence to the belief that he was not there for any good. The extreme protectionists were evidently afraid of the movement, for they felt that a motion to suspend the rules for the purpose of passing the Senate bill might receive a large Republican and Democratic vote, aggregating the necessary two-thirds. The anxiety of some of the Democratic members to get the subject acted upon is attributed to their fears of trusting it to a Democratic House on account of the effect it may have on the party politically. There are some who claim that there is a faction that would prefer to see an imperfect bill passed, so as to reopen the whole question at the next session. Since the question is in such a mixed condition, all sorts of speculations have been rife as to motives and prospects. Each party has been watching the other to see that they get no advantage. Their premises are as widely apart as can be imagined. If the question should come directly before the people they will have plenty of scope to operate upon. There is no doubt that this will be the issue, and that the tariff will be compelled to go through with the ordeal of a campaign before it can be finally disposed of.

AN ERROR IN THE BILL.

On Monday Mr. Vance called the attention of the Senate to a mistake that had been made in the tariff bill by adding after the words "square foot" the words "when manufactured from tempered steel wire, 45 cents per square foot." This, it was shown, was not adopted; therefore the Senate by resolution informed the House of the error in the engrossed copy of the amendments adopted by the Senate to the House Internal Revenue Reduction bill, and requested its return for the correction stated. The bill was returned to the Senate, the corrections made, and by resolution was sent back to the House.

PARLIAMENTARY MANEUVERS.

Later in the day the amendment to the rules to facilitate tariff consideration, which had been reported from the Committee on Rules, was called up as a privileged question. Mr. Carlisle raised the question of consideration. The rule was then reported. The Speaker put the question: "Will the House now proceed to consider the rule just read?" Upon this the yeas were 134; nays, 126. Mr. McLane, of Maryland, then inaugurated a fillibustering scheme by moving to adjourn, which was defeated—yeas, 81; nays, 174. The House, after some parliamentary details, proceeded to discuss the report of the Committee on Rules. After recess, at the night session, the previous question was ordered—yeas, 121; nays, 105—and the House proceeded to debate under the half-hour rule. On agreeing to the resolution reported by the Committee on Rules, the yeas were 120 and nays 20. No quorum voting, a call of the House was ordered, which showed 237 members present. Several efforts were made to adjourn, which ultimately succeeded. On Tuesday morning Mr. Kelley moved to suspend the rules, take from the Speaker's table the Internal Revenue bill, with Senate amendments, non-concur in the amendments, and appoint a conference committee of five members on the part of the House. Agreed to—yeas, 148; nays, 110.

STEEL BLOOM QUESTION REVIVED.

A new question involving the duty on steel blooms has just been submitted to the Secretary of the Treasury in the case of Richard F. Downing against Robertson, Collector of the Port of New York. In a late decision the blooms involved were rated at 30 per cent. The importers are now urging the Government to acquiesce in this decision. The manufacturers, on the other hand, insist upon the higher rate. This case was brought up before the United States Circuit Court to test the correctness of the imposition of 45 per cent. ad valorem duty on steel blooms, the plaintiff claiming that but 30 per cent. ad valorem should be charged. The jury rendered a verdict of $4843 for the plaintiff. The Government, however, is not willing to permit this important question to rest here, and will take it to the Supreme Court for review and final decision. The request of the plaintiff is now to prevent the appeal to the Supreme Court by arguments to justify the payment of the award.

THE LABOR QUESTION.

Senator Blair, chairman of the Committee on Education and Labor, said to the correspondent of *The Iron Age* that the pressure of business was so great and the time of the session now so short that the committee was compelled to suspend further inquiry into the causes of strikes and the relations of labor and capital, under the bill of last session. The committee, however, have authorized him to submit a resolution asking authority from the Senate to continue the investigation at different points during the adjournment. These investigations have hitherto been confined to the committee room, and several delegations have presented their views. It is now proposed to visit the industrial centers and take testimony there from manufacturers and responsible parties representing labor.

INCORPORATION OF NATIONAL TRADES UNIONS.

Senator Blair, in order to give the investigations of the committee some systematic arrangement with the view to results, has submitted a bill, reference to which has already been made in this correspondence, to to legalize the incorporation of national trades unions, which was referred to the Committee on Education and Labor. No action will be taken on this bill now, but during the summer peregrinations of the committee it is proposed to determine whether the scheme would operate favorably to both the laboring and manufacturing classes as a means of settling questions involving labor.

THE TEXT OF THE BILL.

As the bill will be prominently associated with the inquiries of the committee, it may be important to know something more in detail as to what it proposes and how to put the same into execution.

The bill provides that the term "National Trade Union," in the meaning of the act, shall signify any association of working people having two or more branches in the States or Territories of the United States, for the purpose of aiding its members to become more skillful and efficient workers, the promotion of their general intelligence, the elevation of their character, the regulation of their wages and their hours and conditions of labor, the protection of their individual rights in the prosecution of their trade or trades, the raising of funds for the benefit of sick, disabled or unemployed members, or the families of deceased members, or for such other object or objects for which working people may lawfully combine, having in view their mutual protection or benefit.

That any national union, or sub-union under the jurisdiction of a national union, as described, is legalized in carrying out its lawful objects as aforesaid, and any person who shall prevent, or endeavor to prevent, any such organization from carrying out its lawful objects as aforesaid, shall be deemed guilty of a misdemeanor, punishable in any court of competent jurisdiction by a fine not exceeding...., or imprisonment for a term not exceeding...., or both, at the pleasure of the court.

That a national trade union shall, upon application to any United States court, be provided with a charter as a national trade union, bearing also the technical name by which said national trade union is known or desires to be known to the trade. Such charter of incorporation shall entitle said national union and each or all of its branches to sue and be sued, to implead and be impleaded, to grant and receive, in its corporate or technical name, property, real, personal and mixed, and to use said property and the proceeds and income thereof for the objects of said corporation as in its charter defined.

That an incorporated national trade union shall have power to make and establish such constitution, rules and by-laws as it may deem proper to carry out its lawful objects, and the same to alter, amend, add to or repeal at pleasure.

That an incorporated national trade union shall have power to define the duties and powers of all its officers, and prescribe their mode of election and term of office, to grant charters to sub-unions in any State or Territory of the United States, or in any other country; and all sub-unions organized under its jurisdiction shall have power to purchase, hold or dispose of such real or personal property as may be needed to carry on their business as provided in this act, and such incorporated national trade union and all sub-unions shall have power to require all officers holding places of trust to execute bonds, with approved sureties, for the safe keeping and paying over to their respective unions, whenever directed by them, of all moneys belonging to their respective unions in their keeping and under their control.

That the headquarters of an incorporated national trade union shall be located in such city in the United States as shall from time to time be determined by such national trade union.

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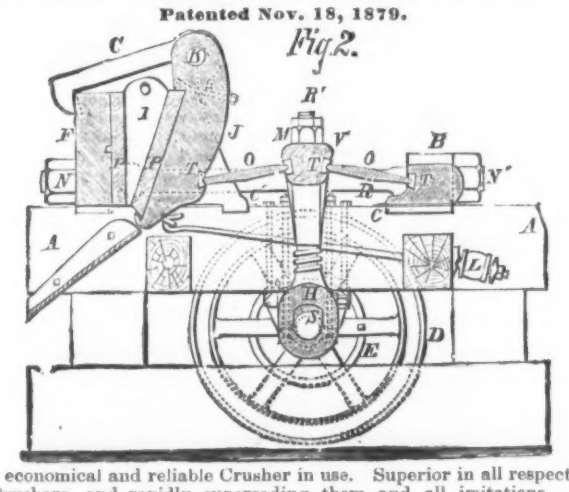

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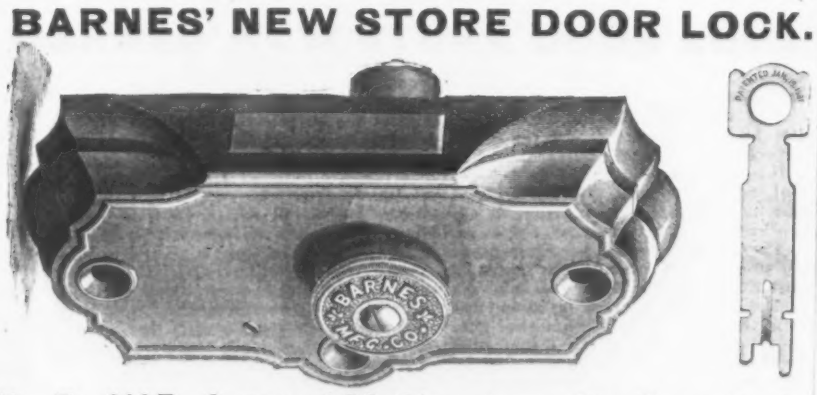

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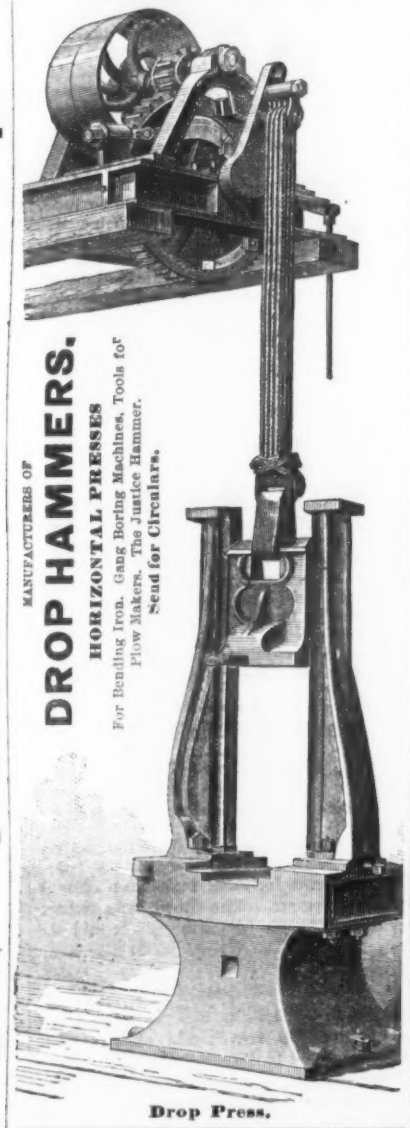

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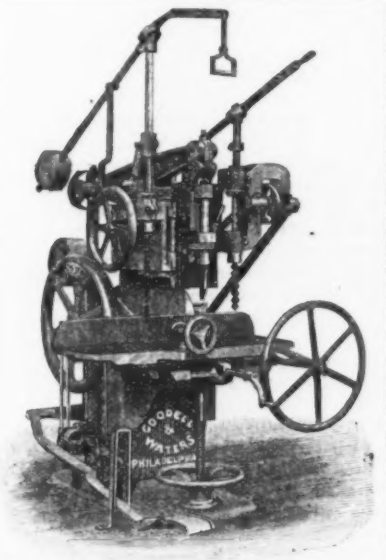

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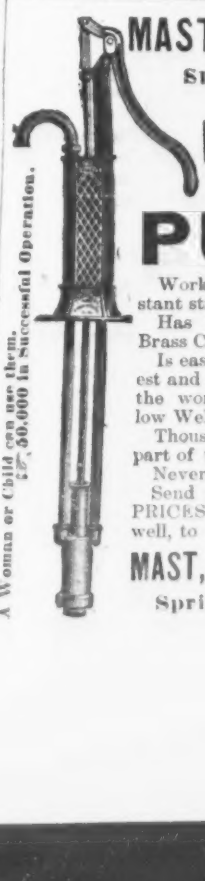

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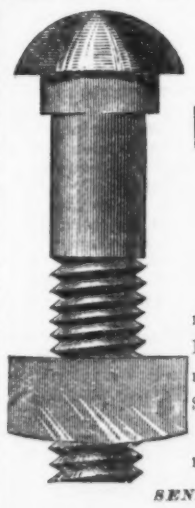

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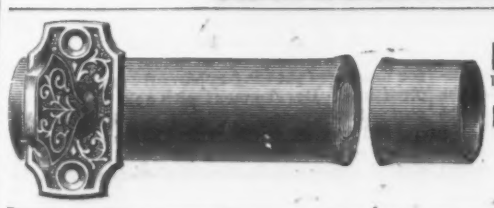

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The Sombart Gas Engine Company, of 215 Center street, New York City, are making a new form of gas engine, exclusively designed for small powers up to 2 horse-power, to be used in small shops and domestic industry.

The engine, as will be seen from the perspective view, Fig. 1, is of the inverted ver-

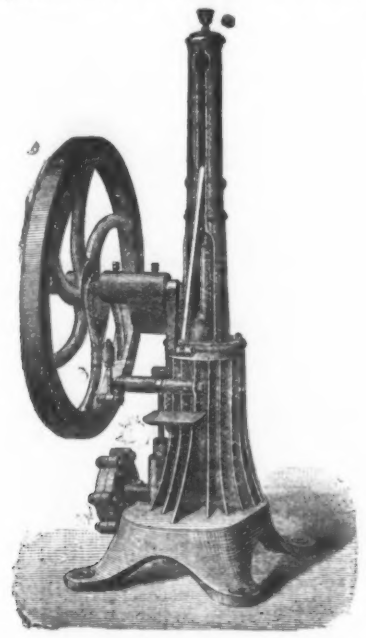

Fig. 1.—The Sombart Gas Engine.

tical type, and consists of a cylinder in which moves a piston, P, shown in the vertical section, Fig. 2, attached to a hollow piston-rod, L, in the manner indicated. The upper end of the piston-rod fits into a circular slide moving in the guide, which is placed on top of the cylinder (Fig. 1). A connecting-rod transmits motion from the piston-rod to the crank. The guide is cylindrical in shape, and is provided with a slot, as shown, in order to allow the passage of the connecting-rod. The method of operation of the engine will perhaps be best understood by referring to Fig. 2. The valve-chest is arranged on the side of the cylinder next the fly-wheel, and consists simply of a cylinder into which fits the distributing valve V. The latter, Fig.

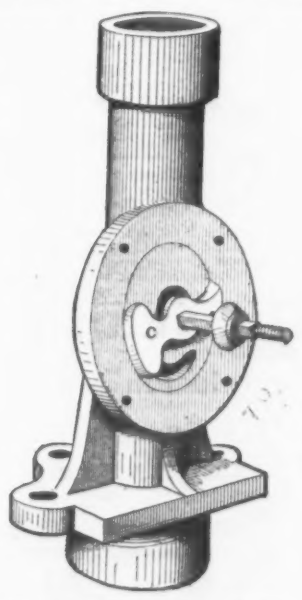

Fig. 3.—The Regulating Valve.

9, is cylindrical, and is moved up and down by the rod V', which, by a combination of levers, receives motion from the eccentric on the main shaft. A portion of the body of the valve is cut away so as to make room for the passage of gas and air from the respective supply pipes to the cylinder, and the channel so formed is represented by the letter D', and extends through about three-quarters of the circumference. Both the upper and lower portions of the valve are hollow, the former being made in this way so as to ac-

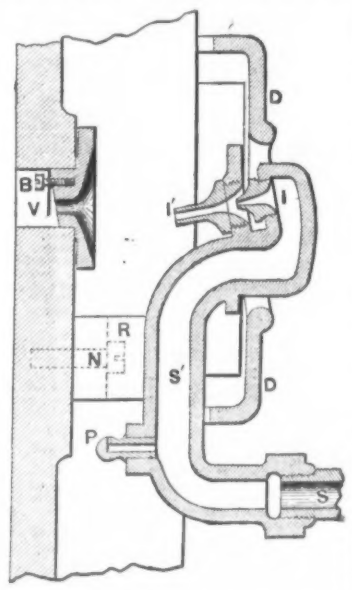

Fig. 4.—Longitudinal Section of Igniter, Showing the Orifice in the Cylinder Wall.

commodate the oscillations of the valve-stem, which, as shown, extends some distance into the valve, and oscillates around a pin, M. The lower portion of the valve is made hollow, so as to facilitate the exhaust of the waste gases, and for this purpose is, moreover, furnished with an opening, A, through which the products of combustion issue on the return stroke and pass off through the exhaust pipe E. Any desired length of pipe may be used for this purpose, so as to carry the waste gases to any distance.

The gas used in the engine is supplied through a valve and pipe to be hereafter described, and which is not seen in our sectional view of the cylinder, running, as it does, in a direction at right angles to the air-supply pipe. The latter is in direct connection with the air-valve, of which a longitudinal section is given, and supplies the proper proportion of air required in the explosive mixture. The air-valve, air-pipe and valve-chest are practically one piece. The valve, as shown, consists of a cast-iron plate, J, provided with two rows of perforations, the latter being covered by a ring of rubber, *m*, which is kept in position by another ring of sheet iron and small bolts placed at suitable intervals apart. Behind the plate J, which is fastened by means of bolts, is another perforated plate, H, through which the air must pass before entering the cylinder. Referring to the gas-valve previously mentioned, it should be stated that the gas enters through the pipe S, Fig. 6, and then passes through small apertures, *m m*, in the piece M, which, as in the case of the air-valve, are covered by means of a piece of rubber. In this particular instance, however, the rubber ring is supplanted by a rubber disk, which is held down by a small circular plate of cast iron with projecting flanges, the latter limiting the hight to which the edges of the rubber disk are raised by the suction produced by the ascending piston. Another perforated disk, P, is attached to the piece N, and the latter is firmly secured to the portion M by bolts, which, however, are not shown in the engraving. The pipe S' finally leads the gas to the valve-chest. Before proceeding any further, attention should be drawn to the gas-regulating valve and to the arrangement of the gas supply pipe, by means of which a uniformity of pressure and a thorough control of the gas may be secured. Fig. 8 represents the general arrangement, and we think that with the following explanation no difficulty will be experienced in understanding it. The supply of gas is taken from the main supply pipe S, which, as shown, branches off in two different directions, a portion of the gas entering the pipe S', which leads to the igniter, and the remaining portion passing downward and entering the intermediate pipe P. This pipe is threaded at the ends, and may thus be readily attached to or detached from the upper piece and the lower pipe S''. A wooden plug is inserted at the middle of the length of the pipe, and the latter is moreover provided with numerous perforations. The pipe itself runs through a rubber bag, and the gas, being prevented from passing directly through the pipe on account of the wooden plug, issues through the perforations above mentioned, passes into the bag, and then enters the apertures in the lower half of the pipe, whence it passes through the regulating valve. The rubber bag above referred to is of course distended, and by readily yielding to any sudden fluctuations of pressure tends to insure uniformity of the same.

So far as the regulating valve proper is concerned, it should be stated that the gas takes the course indicated by the arrows in Fig. 8, passing first from the pipe S' into the chamber A, and then through the channel H into the lower portion of the pipe S', which, it will readily be seen, is divided into two distinct portions by a partition. The valve C, which regulates the degree of opening of the lower orifice, is more clearly shown in the perspective view, Fig. 3. The upper orifice is narrow and high, while the lower one is of an elongated form, as shown, having, however, the same area as the other. When the valve C is in a vertical position the lower orifice is closed, and no gas is delivered to the engine. In order to effect the required regulation of the supply, the valve is mounted on a small arm of square section, which, moreover, carries two springs and an index, I (Figs. 7 and 8). The larger spiral spring tends to bring the index back to its original position, while the smaller spring tightly presses the valve C against its seat, thus avoiding leakage. The dial V is fastened by four bolts in the manner indicated, and is furnished with a slot, L. A screw, B, passes through this slot and through one end of the index I, and by moving it along in either one or the other direction and turning the milled head, the index may be clamped at any desired point. If the reader will refer to Fig. 8, there will perhaps be no difficulty in understanding the operation. The dial, as shown, is marked "open" and "shut," and any intermediate degree of opening may readily be effected by proceeding in the manner indicated above.

The pipe S', shown in Fig. 8, is connected with the pipe S (Fig. 4), by means of rubber tubing, thus supplying gas to the burner I'. This burner, as shown, is not in a direct line with the orifice in the cylinder wall, but is somewhat depressed, and it is the suction produced by the ascending piston which draws the flame through the valve V into the cylinder so as to ignite the charge. The valve V is simply a small iron plate supported by the bolt B, and when not acted upon by the force of the explosion or by the entering air, it tends to remain in the

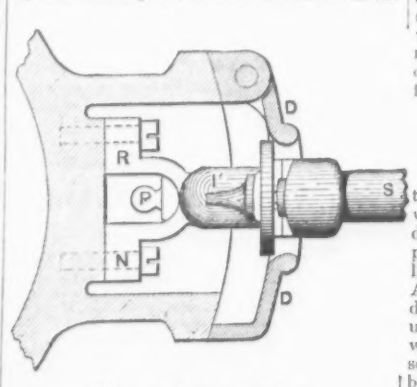

Fig. 5.—Plan of Igniter.

position shown in the engraving. A small lateral branch issues from the lower portion of the pipe S' (Fig. 4), and is furnished at its extreme end with a small orifice, P through which gas issues. It sometimes happens that the igniting flame at I' is extinguished by the sudden rush of air due to the explosion of the charge in the cylinder, and when this is the case the small flame at P serves to relight it. A plan of the igniter is shown in Fig. 5, from an inspection of which the reader will readily understand the method adopted to support the pipe S' and the nozzles I and I'; D is a door which closes the igniter chamber.

It is perhaps needless to dwell at any great length upon the operation of the engine, which is exceedingly simple. When the piston ascends, the air and gas enter through their respective supply pipes, on account of the suction produced, and become thoroughly mixed while passing through the cylinder port. When the bottom of the piston has passed the opening of the ignition valve the igniter inflames the explosive mixture in the lower portion of the cylinder, and the ascending stroke of the piston is completed by virtue of the expansion thus produced. When the piston descends, the burnt gases are blown out of the cylinder through the exhaust pipe in the manner already indicated in our preceding remarks. An interesting feature in connection with the engine, and one which deserves some attention, is the method by means of which overheating of the cylinder walls is prevented. In many engines of this general type this is effected by means of water jackets. In this case, however, as will be seen from the perspective view, Fig. 1, the cylinder is provided with a number of ribs that form a large area of radiating surface, and the heat generated by the explosion is rapidly given off in this way. While recently inspecting an engine of this kind, which had been worked for some 15 or 20 minutes, it was found that the cylinder walls were heated only to a moderate extent, so as to allow it to be touched with the hand without any inconvenience. The manufacturers state, moreover, that by slightly differing from the general construction they have succeeded in working their engines with gasoine, thus enabling the inhabitants of small towns, villages, &c., where no gas works exist, to provide themselves with motive power. From the general description that has been given of the engine it will be seen that it is only single-acting, and in order to carry the piston through the down stroke, the fly-wheel is of considerable weight, thus giving out the power that has been stored up during the ascending stroke of the piston in the interval in which no power is derived from the explosion of the gaseous mixture. Every provision has been made to insure a thorough lubrication of the working parts, and the valve, instead of working in the bore of a body cast in one piece with the cylinder, as is the case with some engines of this type, now slides in an isolated piece, embracing the gas-valve and the exhaust pipe, and can be firmly connected to and easily taken off the cylinder by means of screw-studs. The result of this is that any wearing of these parts involves no displacement of the whole engine, but of this part only. The engine is manufactured in sizes from ⅛ up to 2 horse-power.

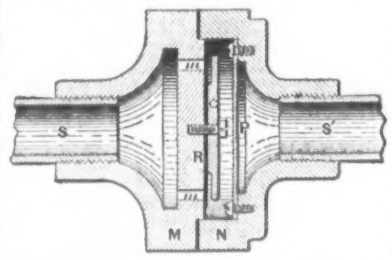

Fig. 6.—Longitudinal Section of the Gas Valve.

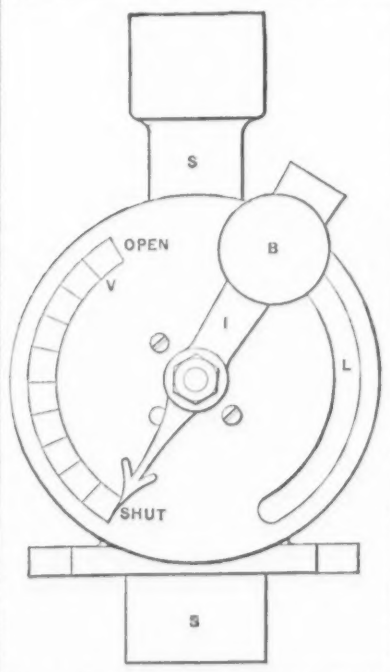

Fig. 7.—Front View of Regulating Appliance.

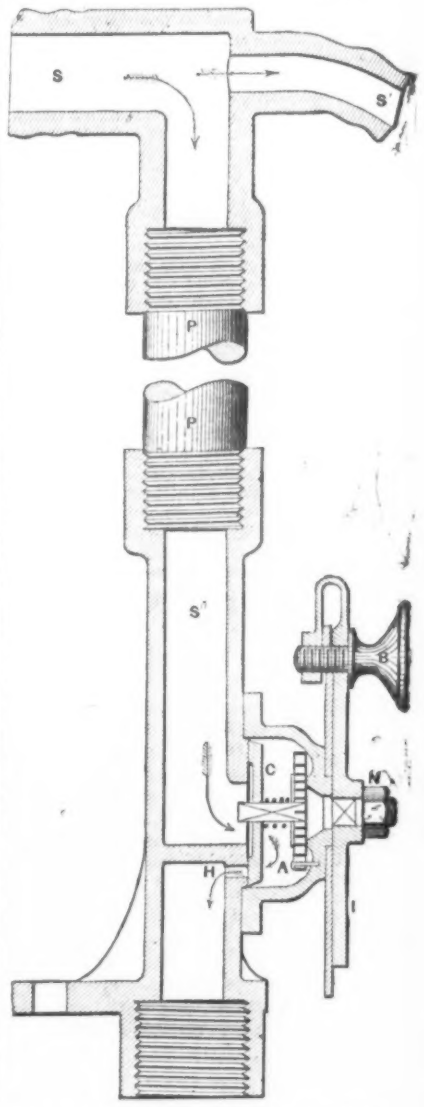

Fig. 8.—Sectional View of Regulating Valve and Supply Pipe.

Wire Railway.

A description has recently been given in the German technical press of a wire railway in connection with the coal-mining industry established near the Hersteigg, the products of which it brings to the main line belonging to the Southern Railway of Austria. In its alternating rise and fall during its distance of 3000 yards there is a useful excess of incline of about 142 yards, which, it is said, suffices to keep the line in self-acting working after it has been started by means of the 12-horse-power engine provided for that purpose. When there is no return load to be sent to the mine, the speed of the line can be regulated by a brake. Under these circumstances, the cost of working the line is estimated at about 5½ cents per ton of coal. In its general arrangement the railway forms a straight line, and consists of two drawing ropes and the train rope. The line which is used for conveying the coal to the station is 1.10 inches thick, and is composed of 19 steel wires each 0.18 inch in diameter. The line on which the coal vessels are returned to the mine is only 0.66 inch thick, the 19 steel wires of which it is composed being only 0.13 inch thick. Both ropes consist of wires about 765 yards long, coupled to each other, and for the ropes a breaking strength of 73 tons per square inch section is guaranteed. At the ends of the ropes weights of 5 and 3 tons are applied in the usual way for obtaining the proper tension. The distance between the 17 supports varies from 60 to 400 yards. The train rope is 0.6 inch thick, and consists of 12 soft-steel wires of 0.07 inch diameter, and runs at a speed of 1⅝ yards per second. The vessels which convey the coal follow each other at a distance of about 83 yards; thus 36 are always on the way to and the same number coming from the station. Each vessel contains about 10 bushels, or about a quarter of a ton, of brown coal, the total quantity carried per hour being about 17½ tons. The cost of the line was about $25,000.

Drawbridge Safety Switches.

The New York, New Haven and Hartford Railroad Company have adopted a system of drawbridge signals which, it is claimed, will greatly reduce the danger of accidents. These signals are worked by a series of levers, five in number, the first two working semaphore signals at a distance of 1900 feet and 800 feet, respectively, from a bridge. The other

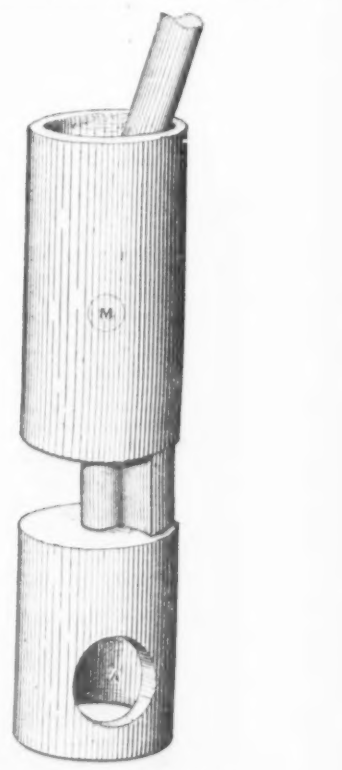

Fig. 9.—The Distributing Valve.

three work the switches of the siding and the lock of the bolt which holds the draw in place. Before the bridge can be unlocked, that a vessel may pass through the draw, these levers must be worked in their order. It is impossible to work them in any other way, the interlocking preventing the drawtender or signalman from moving the higher numbered lever until he has first moved the lower number. He cannot, when the draw is closed, replace the levers except in the regular reverse order. It follows that a danger signal must first be shown at a distance of 1900 feet from the draw, and if that warning to bring his train under control for

a stop is neglected by the engineer, the signal is again given at 800 feet distant. Should this warning be neglected, the engineer will find his train shunted to a side track, and thus prevented from plunging into the open draw, for the draw cannot be opened unless it has been previously unlocked; it cannot be unlocked until the safety-switch has first been unbolted and set for the siding; the switch cannot be set until the home signal has been set for danger, and the home signal cannot be set for danger until the distance signal has been so set. These operations are repeated on the other side of the draw, which is fitted with a bolt at each end. Supplemental apparatus is provided so that the signalman may know at a distance of 1¼ miles that a train is approaching, so that the draw may not be opened and trains delayed unnecessarily. It is further claimed that when the draw, even if closed, should be unlocked, the safety switch cannot be thrown on the main line either by accident or design, and therefore no train can possibly run into the draw.

The trade reports for the past year show that the Dominion of Canada imported $112,648,927 worth of goods, an increase of $21,037,323 over the year previous. The exports show an increase of $3,846,380. The total liabilities of the Dominion on the 1st of July, 1882, were $205,365,251, an increase of $5,503,741 over the previous year. The total assets of Canada are set down at $57,703,601. Of the public debt, $132,122,875 are payable in London and the balance in Canada. The annual interest payable upon the entire debt is now $7,848,764, against $7,748,785 in 1880–81. The interest upon the assets is calculated at $1,057,474.

Special Notices.

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Edwards.—Practical Steam Engineer's Guide. By Emory Edwards, M. E.; 119 illustrations, 420 pages, 12mo, cloth; 1882 . . $2.50

Beginning with a review of the non-condensing steam engine, the author, in simple language, explains the design, construction and management of American stationary, portable and steam fire engines. The book is not in the least theoretical, and steam users in general will find this a useful guide for practical work.

Nystrom.—Pocket-book of Mechanics and Engineering. By John W. Nystrom, C. E.; 15th edition, revised and enlarged, illustrated, 510 pp., 16mo, pocket-book form; 1882 . . . . . $3.50

The high reputation of the author of this book is sufficient guarantee of its comprehensiveness and accuracy. It treats of air, heat, steam, expansion of water, friction, strength of materials and dynamics. Tables of circumference and area of circles and logarithms are included. It is a valuable book for architects and engineers.

Watt.—Electro-Metallurgy. By Alexander Watt; new edition, enlarged, 195 pages, 12mo, cloth; 1882 . . . . . $1

A practical work on the electro-deposition of copper, silver, gold, brass, bronze, iron and nickel, with details and processes carefully described. The present edition contains much new matter upon the deposition of nickel.

Trautwine.—Field Practice of Laying Out Circular Curves for Railroads. By John C. Trautwine, C. E.; 11th edition, enlarged and rewritten, 192 pages, 12mo, tucks; 1882 . . . . $2.50

Any problem in laying out railway curves for which a solution would be sought, may be readily solved by consulting this little book.

Fanning.—Practical Treatise on Hydraulic and Water Supply Engineering. By J. T. Fanning; 3d edition, 37 full-page illustrations and many diagrams, 621 pages, 8vo, cloth; 1882 . . $5

This work presents an excellent review of the latest and best methods practiced for supplying towns and cities with water. Principles and methods of construction are practically explained, and numerous tables and statistics to facilitate calculation are given. To town officers and all interested in water supply, as well as to engineers, this book will be of interest and decided value.

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One Horizontal Tubular Boiler, 3½ in. x 14 in.
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One Upright Boiler, 30 in. x 8 ft.
One Portable Engine, 25 H. P.
Shafting, Pulleys, Hangers, Vises, &c.
One Horizontal Engine, 12 in. x 16 in. New.
Two Ross Paint Mills.
One No. 3 Bliss & Williams Foot Press, with Dies from pints to gallons.
Four Licorice or Bark Mills.
One Tank, 30 ft. x 12 ft. x 10 ft.; 27,000 gallons.
Five Harris Paint Mills.

J. Gray's Machinery Depot, 37 Dey St., N. Y.

Bargains.

48 in. x 12 ft. Horizontal Tubular Boiler.
42 in. x 13 ft. Horizontal Tubular Boiler.
36 in. x 10 ft. Horizontal Tubular Boiler.
42 in. x 9 ft. Vertical Tubular Boiler.
36 in. x 8 ft. Vertical Tubular Boiler.
35 in. x 6 ft. Vertical Tubular Boiler.
30 in. x 6 ft. Vertical Tubular Boiler.
26 in. x 6 ft. Vertical Tubular Boiler.
24 in. x 5½ ft. Vertical Tubular Boiler.
22 in. x 4½ ft. Vertical Tubular Boiler.

The above Boilers are new, made of best iron, and are ready for immediate delivery. We also have a large stock of new Engines, 3 in. to 16 in. cylinder, vertical and horizontal. Second-hand Engines and Boilers, all sizes.

LOVEGROVE & CO.,
152 N. Third St., Philadelphia.

For Sale.

A machine with oscillating rolls for rolling shapes. Face of rolls, 15 inches long, and necks 7 inches diameter. Will be sold cheap if applied for immediately.

Address "NOYS,"
Office of *The Iron Age*, Pittsburgh, Pa.

SHAPER FOR SALE.

A new Shaper, full 8-inch stroke, and can be adjusted to any less distance; traverse, 8½; driving pulleys, 8x2½; cone, three speeds; automatic and reversible feed; 8-inch swivel chuck; table, 8x8; vertical adjustment, 7 inches; very finely finished. Weight, 700 lbs. Price, $200, with chuck, countershaft and crank attachment for operating it by hand—very convenient for overtime work.

PEERLESS PUNCH AND SHEAR CO.,
38 W. Dey st., New York.

Fine Machinery for Sale, or Investment in a Joint Stock Company.

We have the latest improved Steam Power Machinery for the manufacture of wagons complete. We have already established for the wagons of our manufacture a large trade and fine reputation. This machinery is for sale for cash, or part cash, and balance in approved paper, or it will be put into a stock company at its appraised value, in paid-up stock. E. BALLAUF & CO., Gen. Agents for the S. A. Kelly Mfg. Co., Jefferson, Texas.

Wanted.

An experienced, practical man to superintend the manufacture of Foundry Iron at the furnaces (two) of the Albany City Iron Company.

Apply (in the first instance by letter only) to

WM. R. HILLS, Treas.,
Albany, N. Y.

Wanted.

An old-established firm in Thames street, manufacturing specially one description of Ornamental Castings, but having warehouse too large for own use, are desirous to meet with manufacturers of other goods requiring them stocked in London and sold on commission. Apply to

203 30, care of Ironmonger Newspaper,
42 Cannon street, London, England.

Wanted.

A Partner with $5000 to $10,000 in a Foundry and Machine Business, established in 1824. For particulars, inquire of

I. H. COLLER,
Poughkeepsie, N. Y.

Wanted.

Power Shears.

Must be in first-class order, with capacity to cut iron and steel cold to 2⅝ inches round or square. Send full particulars, with lowest price for spot cash, to

GUELPH CARRIAGE GOODS CO.,
Guelph, Canada.

We Want a Salesman.

FETTER DRIVE SCREW CO.,
104 John st., New York.

A YOUNG MAN of experience, who speaks English, French and German, desires to introduce or sell some specialty in the Hardware line in the leading European cities. Best of references given. Address W.,
Care of A. K. Pruden, St. Paul, Minn.

SUPERINTENDENT of Foundry and Machine Shop, with practical ability and experience in Architectural and General Ironwork, Machinery, &c., construction, working drawings and estimating, desires employment, either as general superintendent or foreman in charge of work. References first-class. Address J. S. S.,
526 E. 144th st., New York.

WANTED.—An experienced Chemist, thoroughly familiar with the different branches of the Iron and Steel industry, is open for engagement. Situation as Chemist or Assistant Superintendent at steel works preferred. First-class references. Address METALLURGIST 30,
Office of *The Iron Age*, 83 Reade st., New York.

WANTED—A situation as Roll Turner or Superintendent of Rolling Mills. Have had 15 years' practical experience. References if required. Address ROLL TURNER,
465 Liberty st., Pittsburgh, Pa.

Special Notices.

New & Second-Hand Machinery.

FEB. 21, 1883.

1 Engine Lathe, 14 in. x 5, 6, 7 and 8 ft. Grant & Bogert.
1 " " 26 in. x 12 ft., Grant & Bogert. New.
1 " " 45 in. x 15 ft. Good order.
1 " " 36 in. x 12. 12 ft. New.
1 " " 42 in. x 14 ft. New.
1 " " 14 in. x 6 ft. Star Tool Co. New.
1 " " 16 in. x 6 ft. New.
1 " " 14 in. x 8 x 6 ft. New.
1 " " 16 in. x 7 ft. Bridgeport. New.
1 " " 13 in. x 5 ft. and 6 ft. Ames. New.
1 " " 16 in. x 6, 7 and 8 ft. Ames. New.
1 " " 18 in. x 8 and 16 ft. Lodge & Barker. New
1 " " 27 in. x 10 in. Lodge & Barker
1 " " 22 in. x 12 ft. New.
1 " " 20 in. x 10 ft. New.
1 " " 28 in. x 16 ft. New.
1 " " 24 in. x 12, 14 and 16 ft. New.
1 " " 11 in. x 4 ft. and 5 ft. Prentiss. New.
1 " " 12 in. x 5 ft. Young. New.
1 Plain Engine Lathe, 16 in. x 4 ft. New.
1 " " " 15 in. x 4 ft. New.
1 Fox Lathe, 15 in. x 5 ft. Am. Tool & Machine Co.
1 15 in. x 4 ft. Turret Lathe. Lodge & Barker.
1 8-ox Turret Lathe, 16 in. x 6 ft. Lodge & Barker. New.
1 Planer, 60 in. x 60 in. x 17 ft. Good order.
1 " 32 in. x 32 in. x 7 ft. Good order.
1 " 16 in. x 16 in. x 3 ft. New.
1 " 22 in. x 20 in. x 5 ft. New.
1 " 24 in. x 24 in. x 6 ft. Hendey. New.
1 " 26 in. x 26 in. x 7 ft. New.
1 " 16 in. Lever Table Drill. New.
1 Crank Planer, 16 in. x 16 in. x 13 in. New.
1 16 in. Upright Drill. New.
1 20 in. " Prentiss. New.
1 24-in. " Prentiss. New.
1 30-in. " Prentiss. New.
1 25 in. swing B. G. & S. F. Drill. Blaisdell. New.
1 28-in. " " " " "
1 36 in. swing, B. G. & T. F. Drill. New.
1 15-in. Shaper. Gould & Eberhardt. New.
1 10-in. Shaper. Gould & Eberhardt. New.
1 15-in. Shaper. Hendey. New.
1 24 in. Shaper. Hendey. New.
1 24-in. Shaper. Hendey. Good order.
1 9 in. Shaper. Hewes & Phillips. New.
1 9-in. Shaper. New.
1 14-in. Shaper.
Full Assortment of Milling Machines, Spindle Drills, &c., of Garvin's. New. [& Lamson.
1 each Nos. 2 and 4 Screw Machines, Wire Feed. Jones
2 No. 2 Lincoln Millers. Good order.
2 No. 3 Lincoln Millers. New.
1 Hand Lathe, 12 x 4, 5 and 6 ft. New.
1 Hand Lathe, 16 in. x 6 and 7 ft. New.
1 Boring and Turning Mill, 50 in. New.
1 Boring and Turning Mill, 72 in., 2 Heads. New.
1 each 3 and 7 spindle Nut Tappers. New.
1 Gig Saw. Good as new. Rogers.
1 700-lb. Steam Hammer. Ferris & Miles. Good order.

New York Agency of
THE TANITE CO. and GRANT & BOGERT MACHINE TOOL WORKS,

H. PRENTISS & CO., 42 Dey St., N.Y.

For Sale.—$50,000.

A rare opportunity offered to parties wishing to engage in a well-established and highly profitable Hardware Manufacturing Business, located in a leading city of Connecticut, with the best facilities for shipping both by land and water. The line of goods is well known and has an established reputation throughout the country. The business is now increasing and could easily be doubled the coming year. The present company, for want of sufficient capital to run the business properly, will either sell the whole business complete, including Tools, Machinery, &c., and stock on hand, or will retain their present interest and allow the right parties to come in to increase the capital stock, or will sell the valuable plant separate and remove the Tools, Machinery, &c. The business can now be seen running. For further particulars, terms, &c., address at once,

T. K. W., Lock Box 91,
Middletown, Conn.

For Sale.

A SCRAP YARD,

LOCATED AT PITTSBURGH, PA.,

Twenty-first & Smallman Sts.

96x120 feet; four Shears, Boiler, Engine, Carts, &c. Yard now in operation. Good opportunity for parties understanding the business.

Address FOX & DRUMMOND,
68 Wall st., New York.

EXTRAORDINARY OPPORTUNITY.

The Best Located Ironworks in Pennsylvania

At Public Sale.

IN EXCELLENT CONDITION.

The Lochiel Rolling Mill and Furnace Properties,

situate at Harrisburg, Pa., with the Pennsylvania Railroad, the Reading Railroad and the Pennsylvania Canal all running through the property.

The foregoing property consists of about 48 acres of land in the City of Harrisburg, Pa., with a large and complete Rolling Mill for making Muck Bar, Bar Iron, and Iron and Steel Rails. A first-class Blast Furnace and numerous dwelling houses and shops, with all the necessary appliances of a first-class establishment.

It will be sold on easy terms at public sale, March 15, 1883, at 12 o'clock p. m.

For conditions of sale, diagrams and descriptive circulars, address

J. H. LANDS, Superintendent,
Harrisburg, Pa.

For Sale.

1 Engine Lathe, 15 in. swing x 8 ft. bed.
5 Engine Lathes, 17 in. swing x 8 ft. bed.
2 Engine Lathes, 17 in. swing x 10 ft. bed.
1 Engine Lathe, 21 in. swing x 8 ft. bed, cross-feed
3 Engine Lathes, 21 in. swing x 12 ft. bed, cross-feed
2 Engine Lathes, 21 in. swing x 12 ft. bed, cross-feed
2 Hand Lathes, 12 in. x 4 ft. bed, back-geared.
5 Heavy Molding Screw Presses.

ISRAEL H. JOHNSON, Jr., & CO.,
1422 to 1426 Callowhill St., Phila., Pa.

COPARTNERSHIP NOTICE.

The business heretofore carried on by me under the style of BRADFORD & ANTHONY is transferred to the new firm, DAME, STODDARD & KENDALL, who will settle all accounts since January 1, 1883.

All business of BRADFORD & ANTHONY prior to January 1 1883, will be settled by Martin L. Bradford, at the store of Dame, Stoddard & Kendall, 371 Washington street, and all communications concerning the same should be addressed to

MARTIN L. BRADFORD,
Surviving Partner of Bradford & Anthony,
February 13, 1883. Boston, Mass.

LIMITED PARTNERSHIP.

This certifies that Warren S. Dame and Ralph M. Kendall of Boston, in the County of Suffolk, Oliver H. P. Stoddard of Hingham, in the County of Plymouth, and Martin L. Bradford of said Boston, have formed a limited partnership, pursuant to the provisions of the Public Statutes of Massachusetts, for the transaction of the business of dealers in CUTLERY, FISHING TACKLE, SKATES and other goods, under the name or firm of Dame, Stoddard & Kendall, the principal place of business to be in Boston. The said Warren S. Dame, Oliver H. P. Stoddard and Ralph M. Kendall are the General Partners.

The said Martin L. Bradford is the Special Partner, and has contributed to the common stock thirty-five thousand dollars, in actual cash payment, as capital.

The said partnership is to commence on the thirteenth day of February, 1883, and is to terminate on the 31st day of December, 1887.

WARREN S. DAME,
OLIVER H. P. STODDARD,
RALPH M. KENDALL,
MARTIN L. BRADFORD.

COMMONWEALTH OF MASSACHUSETTS.

SUFFOLK, ss. February 14, 1883.

Then personally appeared the above-named Warren S. Dame, Oliver H. P. Stoddard, Ralph M. Kendall and Martin L. Bradford, and acknowledged the foregoing instrument to be their free act. Before me,

A. S. WHEELER, Justice of the Peace.

LEIGH'S

DISCOUNT BOOK

Specially arranged for the use of the

HARDWARE TRADE.

Acknowledged by ALL the best work of the kind ever published. Price by mail ONE DOLLAR.

Address **E. B. LEIGH,**
Sec'y The American Brake Co., St. Louis, Mo.

Special Notices.

For Sale.

We have the following second-hand Machinery for sale, viz.:

One Iron Planer, to plane 24 ft. long, 62 in. x 62 in. square. It is powerfully geared, heavy and in good order.

One Iron Planer, to plane 12 ft. long, 36 in. x 32 in., in fair condition.

One Pit Lathe, fan plate, 6 ft diam., with internal wheel full diam., external wheel 38 in. diam., quadruple geared, with turn 10 ft. diam. x 22 in. fan in pit. Swings 60 in. over ways, 48 in. over carriage, 21 ft. 6 in. between centers. All complete.

One Engine Lathe; will take in 14 ft. between centers, and swings 53 in. over ways; has hollow spindle, and is adapted for both turning and boring, with countershaft, all complete.

One Engine Lathe; will take in 12 ft. 6 in. between centers, and swings 48 in. over shears, 32 in. over carriage. It has internal gear and cross feed; countershaft complete.

One Slotting Machine; 12 in. stroke, slots to the center of 46 in.; adjustable table and universal feed motion.

One combined Power Punch and Shears to punch ⅝ x ½ and shear ⅜ in. iron.

THE GEORGE PLACE MACHINERY CO.,
121 Chambers and 103 Reade sts.,
New York.

NEW AND SECOND-HAND

MACHINERY.

MARCH 1, 1883.

The following new and improved Machinists' Tools are part of what we have for early delivery:

1 42 in. swing, 20 ft. bed Engine Lathe. Feb'y 15.
1 36 in. swing, 18 ft. bed Engine Lathe. Feb'y 15.
1 36 in. swing, 14 ft. bed Engine Lathe. Feb'y 15.
1 New Corliss Engine, 16 in. x 42 in. Complete in four weeks.

The following on hand:

1 New Corliss Engine. 12 in. x 36 in. Complete.
1 42 in. swing, 16 ft. bed New Engine Lathe.
1 30 in. swing, 18 ft. bed New Engine Lathe.
1 30 in. swing, 16 ft. bed New Engine Lathe.
1 30 in. swing, 14 ft. bed New Engine Lathe.
1 30 in. swing, 12½ ft. bed New Engine Lathe.
1 26 in. swing, 14 ft. bed New Engine Lathe.
1 22 in. swing, 12 ft. bed New Engine Lathe.
1 19 in. swing, 8 ft. bed New Engine Lathes.
2 19 in. swing, 10 ft. bed New Engine Lathes.
4 18 in. swing, 8 ft. bed New Engine Lathe.
5 15 in. swing, 6 ft. bed New Engine Lathes.
1 12 in. swing, 6 ft. Hand Lathe. New.
1 10 in. swing, 4½ ft. bed Hand Lathe. New.
1 Axle Lathe. Fitchburgh Machine Co. 2d hand.
1 38 in. x 12 ft. Planer. New.
1 32 in. x 8 ft. Planer. New.
2 30 in. x 8 ft. Planers. New.
1 26 in. x 6 ft. Planers. New. Very heavy.
2 22 in. x 4 ft. Planers. New.
1 12 in. stroke Slotting Machine.
2 38 in. swing Upright Drills. B. G. & S. F. New.
1 23 in. Drill. B. G. & S. F. New.
1 22 in. Upright Drill. B. G. & S. F. New.
1 23 in. Drill. Plain.
2 20 in. Drills. Plain.
1 18 in. Bench Drill.
1 4 spindle Drill. New.
1 3 spindle Drill. New.
2 4 spindle Drills. 2d hand.
2 12 in. Shapers. New.
1 14 in. Shaper. New.
2 12 in. stroke Shapers, traveling head, 40 in. traverse double tables. New.
1 6 in. stroke Hand and Power Shaper. New.
1 18 in. Shaper. Lowell Machine Shop. 2d hand.
3 Wood's Patent Bolt Cutting Machines to cut from ⅛ in. to 2 in. inclusive. New.
1 Face Milling Machine. 2d hand.
1 Pond's Double Milling Machine. 2d hand.
1 No. 1 Screw Machine. Brown & Sharpe. 2d hand.
1 Screw Head Slotter. 2d hand.
2 4½ in. Hyde's Patent Centering Machines. New.
1 Bolt Pointing Machine. 2d hand.
1 Double Nut Tapper. New. Horizontal.
2 Double-Acting Presses, No. 3. Nearly new.
1 No. 00 Fowler Press.
4 Single-Acting Presses for power. Nearly new.
100 Foot Presses. Nearly new.
2 Small Power Punching Presses. 2d hand.
1 Foot Punch, with bench. New.
Lot of Forges, 1 Railway Saw Bench, 1 Foot-power Circular Saw.
Cold Rolled Shafting, Pulleys, Hangers, Couplings, &c., always in stock.

The George Place Machinery Company,

121 Chambers and 103 Reade Sts.,

New York.

For Sale.

1 43 in. swing, 14 ft. bed Engine Lathe. New.
1 36 in. swing, 22 ft. bed Engine Lathe. New.
1 36 in. swing, 20 ft. bed Engine Lathe. New.
1 26 in. swing, 22 ft. bed Engine Lathe. New.
1 23 in. swing, 16 ft. bed Engine Lathe. 2d hand.
1 15 in. swing, 9 ft. bed Engine Lathe. 2d hand.
Lot other sizes, new and 2d hand.
1 Iron Planer to plane 30 in. x 30 in. x 13 ft. New.
1 Iron Planer to plane 32 in. x 36 in. x 9 ft. 2d hand.
1 Iron Planer to plane 22 in. x 32 in. x 9 ft. 2d hand.
Lot other sizes, new and 2d hand.
Write for what you want.

J. M. BADGER,
5 Dey st., New York City.

For Sale.

An old-established Hardware and House Furnishing Business in Brooklyn, N. Y. Stock varied and in good shape for general retail trade.

Address, GOODHUE,
Office of *The Iron Age*, 83 Reade st., New York.

For Sale.

One of the best Stocks of Hardware, Stoves and Agricultural Implements in one of the largest and finest cities in Illinois. Business well established and prosperous; an unusually fine opening. It will pay you to investigate. Address

HARDWARE,
care A. C. Bartlett,
cor. Lake & Wabash Ave., Chicago.

For Sale.

No. 6 Sturtevant Blower and Countershaft.
6 Blake Steam Pumps. Good as new.
Nos. 3, 4 and 5 Phila. Hydraulic Works Steam Pumps.
Belt Pump for Hydraulic Press.
4-inch Heald & Sisco Centrifugal Pump.
Small Steam Blowing Engine.

A. G. BROOKS & WINEBRENER,
261 N. 3d St., Philadelphia.

J. SEIDEL,

Commission Merchant,

Box 662,

HABANA, CUBA,

Will be happy to accept the representation of first-class houses manufacturing hardware.

Reference:

COLLINS & CO., 212 Water Street, New York.

SITUATION WANTED.

A young man who is a thorough, practical Bookkeeper and accountant, and who has filled a position as bookkeeper, clerk and general assistant at a rolling mill during the past two years, and possesses a very fair knowledge of plate-mill work, desires to secure an engagement.

Address, M.,
Marsh P. O., Chester Co., Pa.

Trade Report.

BRITISH IRON AND METAL MARKETS.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, Feb. 28, 1883.

Scotch Pig.—The market is dull, with prices steady. We quote makers' prices as follows:

Langloan, alongside,	Glasgow		65/6
Coltness,	"	"	65/
Gartsherrie,	"	"	62/
Summerlee,	"	"	62/
Carnbroe,	"	"	56/
Glengarnock,	"	Ardrossan	55/6
Eglinton,	"	"	50/
Dalmellingt'n,	"	"	50/6
Shotts, at Leith			64/6

Lighterage from Ardrossan to Glasgow is 1/ ₱ ton.

Cleveland Pig.—The market is dull, and prices weak. We quote makers' prices, f.o.b. shipping ports:

Middlesboro' No. 1 Foundry		44/
" No. 2 "		43/
" No. 3 "		40 @ 40/3
" No. 4 Forge		39/6

Bessemer Pig.—Business continues light, the market ruling dull, with prices lower. W. C. Hematites are quoted for lots equal portions Nos. 1, 2 and 3, 50/ @ 52/, f.o.b. shipping ports.

Blooms.—There is no change to note, the market ruling dull and prices nominal. We quote Bessemer Blooms, 7" x 7" nominally £4. 10/ @ £5, f.o.b. shipping ports.

Manufactured Iron.—There is no improvement to report, business being light and prices nominal. We quote at works, nominally:

		£	s.	d.		£	s.	d.
Staff. Ord.	Marked Bars	7	10	0	@	0	0	0
"	Medium "	6	10	0	@	7	0	0
"	Common "	6	0	0	@	6	10	0
Hoops, 20 W. G. and over.								
"	Common Best	7	5	0	@	7	15	0
"	Medium	6	10	0	@	6	15	0
"	Common	6	5	0	@	6	10	0
Sheets, 20 W. G. and under.								
"	Ordinary Best	9	10	0	@	10	10	0
"	Common	7	10	0	@	8	0	0
Welsh Bars		5	12	6	@	5	15	0

Steel Rails.—Dullness pervades the market, and quotations are nominal. We quote Ordinary Sections, £4. 12/6 @ £5. 2/6, f.o.b. shipping ports.

Iron Rails.—Very little doing, and quotations are nominal. We quote Welsh, 30 ℔ and upward, £4. 15/ @ £5. 10/, f.o.b. shipping ports.

Old Rails.—The market is dull and offerings moderate. We quote Old Tees, £3. 15/, and Old D. H's, £4 @ £4. 2/6, c.i.f. New York.

Scrap.—Business continues small, and the market closes dull, with prices unchanged. We quote Heavy Wrought, c.i.f. New York, £3. 5/ @ £3. 15/. Bessemer Crop Ends, run of the mill, are quoted 58/ @ 60/, f.o.b. shipping ports.

Copper.—There is no improvement to note, the market ruling dull, with prices weak. We quote Best Selected, £71 @ £71. 10/, and Chili Bars, £65 @ £65. 5/.

Tin.—The market is dull and prices a little lower. We quote Straits Ingot, spot, £93 @ £93. 10/, and futures, £93. 15/ @ £94. 5/.

Tin Plates.—The market is quiet and quotations are nominal. We quote, nominally:

Tin Plates, 10 x 14,	1st qual.	Charcoal	22/	@	23/
" "	2d "	"	20/	@	21/
" "	1st "	Coke	18/	@	19/
" "	2d "	"	17/	@	18/
Common Coke					14/

Spelter.—The demand is small and prices steady. We quote Ordinary, at shipping ports, £15. 10/ @ £15. 15/.

Lead—Dull and weak. We quote Common English Pig, £13. 7/6 @ £13. 17/6.

Freights.—Steam from Glasgow to New York, 5/ @ 7/, and Liverpool to New York, 2/6; Liverpool to Philadelphia, 3/ @ 4/.

FINANCIAL.

Office of *The Iron Age*,
Wednesday Evening, Feb. 28, 1883.

While there is no radical change in the financial situation, compared with one week ago, there are encouraging signs not then distinguishable. An agreement among the Trunk Line Railroad managers in regard to rates for east-bound freight removes all immediate danger of another "war," and the movement from Chicago to tidewater continues to show large gains on that of last year. The course of foreign trade also continues favorable, so that the balance against the port of New York on the movement of merchandise since January 1 is $10,300,000 less than for the same time in 1882, but is $11,800,000 greater than for the corresponding period in 1881. For the moment, however, the outport markets are extremely dull in European freights. Among our local dry-goods jobbers a fair trade is in progress, but the activity of some previous years at the opening of spring is wanting.

The general business situation, as indicated by the gross exchanges of the clearing houses of 24 leading cities, is mainly satisfactory, there being an increase outside of New York of 10 %, compared with 1882, all Western and Southern points making favorable returns, while a decrease of about 14 % in this city is attributed to the diminished volume of stock transactions. These figures are construed as showing "a widespread improvement as regards the outlook for the spring trade." The number of failures reported throughout the country is 204, which is less than in the previous week, but 69 more than in the corresponding week last year, and several of them were of more than usual importance, comprising 6 in the iron trade and 10 in hardware. The increase noticed is in the Western States. The incubus most seriously felt in all departments of enterprise is the dilatory action of Congress touching tariff and revenue questions. One of our leading bankers, in a circular widely distributed, says: "Let Congress at once meet the demands of the people, and prosperous activity will everywhere be the result." Respecting the crop outlook, it is considered that the present condition is purely conjectural.

Sterling exchange is dull and lower, and the posted rates were twice reduced. To-day the actual rates for 60-day bills were 4.81¼ @ 4.81¾, and for demand, 4.84 @ 4.84½. It is thought probable that to-morrow the Bank of England will reduce its rate to 3 %. Money became suddenly active on Monday, call loans being quoted as high as 9 %, partly due to the demand East and West, the latter to assist in moving produce. A prominent banker writes from Chicago that no unusual amount of money has been ordered to that point on account of "iron failures." We quote 60 to 90 days' indorsed bills receivable, 5½ %; four months' acceptances, 6 %.

On the Stock Exchange the transactions of the week indicate an upward movement, and, compared with 10 or 12 days ago, the entire list is from 1⅛ to 3 % higher, except some of the Northwesterns, the Elevated stocks and a few others. The announcement on Friday of the suspension of the bankers, Hatch & Peters, had little effect. On Saturday the improvement previously noticed was checked, partly by the unfavorable bank statement and a pressure to realize. On Monday the Wabashes were pressed to very low figures, but the Vanderbilt specialties and the Grangers were sustained by reports that purchases were being made on European account. On Tuesday the market was stimulated by news that the tariff bill had been referred to a conference committee, also by the declining tendency of foreign exchange, and prospects of larger earnings by the Northwestern roads. The closeness of the money market had no perceptible influence. To-day the market was dull, but irregular, and closed at a fractional advance over the previous day. Western Union advanced on reports of a favorable decision in the Williams suit, to enjoin a transfer of stock. The most active stocks to-day were Lackawanna at 122, 121¼, 122⅛; St. Paul at 101⅛, 100¾, 100⅞; Union Pacific at 93¾, 93⅜, 93¼; Lake Shore at 109, 108¼, 108½; Michigan Central at 93¼, 92¾, 93; Northwestern at 132, 131⅝, 131¾; Wabash preferred at 46⅞, 46¼, 46½. Dispatches received by *Bradstreet's* announce the suspension of the First National Bank of Peru, Ill. The bank had a paid-in capital of $100,000, and claimed a surplus of $30,000. The First National Bank of Union Mills, of Union City, Pa., closed its doors on Saturday.

The importations of specie and bullion at this port during the week ending February 23 were $128,555, consisting of $177 in gold and $127,921 in silver, as against a total of $75,372 for the week ending February 17 last year. The importations since the 1st of January compare as follows with the movement during the corresponding period last year:

	Since January 1	
	1883.	1882.
Gold	$447,804	$326,488
Silver	446,792	255,778
Total	$894,376	$582,266

The bank return for the week shows a decrease of $2,465,825 in reserve, which now stands at $1,209,000, against $1,433,075 below at the same time last year, and $1,014,625 below at the corresponding date in 1881.

The following is an analysis of the bank totals of this week, compared with that of last week:

	Feb. 17.	Feb. 24.	Comparisons.	
Loans	$328,352,100	$325,391,000	Inc.	$2,038,900
Specie	59,959,300	58,504,300	Dec.	1,495,000
Legal tenders	21,353,700	20,023,500	Dec.	1,330,200
Total reserve	81,353,000	78,527,800	Dec.	2,825,200
Deposits	310,712,700	309,275,200	Dec.	1,437,500
Reserve required	77,678,175	77,318,800	Dec.	359,375
Reserve	3,674,825	1,209,000	Dec.	2,465,825
Circulation	16,541,000	16,498,700	Dec.	44,300

Government bonds closed as follows:

	Bid.	Asked
U. S. 5's, '81, continued at 1½	101¼	—
U. S. 4½'s, 1891, registered	112½	112¾
U. S. 4½'s, 1891, coupon	113½	113¾
U. S. 4's, 1907, registered	119	119¼
U. S. 4's, 1907, coupon	119	119¼
U. S. 3 per cents	104	104¼
U. S. Currency 6's, 1895	128	—
U. S. Currency 6's, 1896	129	—
U. S. Currency 6's, 1897	130	—
U. S. Currency 6's, 1898	130	—
U. S. Currency 6's, 1899	135	—

State bonds were dull, but firm. To-day Alabama, Class B, sold at 100, and Class A advanced 1 % to 82¼; North Carolina 6's, old, sold at 32.

MINING STOCKS.

The closing quotations for mining stocks were as follows:

	Bid.	Asked.
American Flag		9
Amie	19	20
Alice		3.45
Alt. Mon	10	13
Belle Isle	52	
Bodie	1.55	1.80
B. H. & E. n	½	
Bulwer	97	1.00
Bassick	8.50	9.75
Bull Dom	5	8
Big Pittsburgh		19
Bradshaw	10	
California	10	15
Climax	7	10
Con. Va	52	
Chrysolite	1.35	1.40
Cen. Ariz	32	41
Durango	7	10
Dunkin		30
Decatur	7	9
Eureka Con		9¼
Elko Con	10	11
Father de Smet	4.50	5.25
Gr. Prize	50	65
Goodshaw		8
Great Eastern		4
Green Mountain	64	68
Gold Stripe	7	8
Hukill	10	20
Horn Silver	7¼	7½
Harlem	1.15	1.20
Hibernia		6
Hortense		65
Hall-Anders	1.40	1.50
Independence	58	62
Iron Silver	3.00	
Leadville Con	66	70
L. Pitts	60	
Mt. M. Co		5
Navajo	4.95	5.25
North'n Belle	9¼	10
N. Belle Isle		60
New Cen. Coal	10	
Ori. & Mill	14	15
Ophir	2.50	
Pipe Line Cfs	99½	99⅝
Quicksilver	8	
Rappahannock		10
Robinson Con	1.05	1.10
Rising Sun	4	
Red Elephant	7	8
Sierra Grande	2.75	
Standard	6.00	6.50
S. Cliff	39	
Sutro Tun	21	22
South Pacific	5	
St. L. 1 & 4	2	4
Sorona Con	36	
Un. Con	4.50	
Unandilla		4
Vizina	80	

GENERAL HARDWARE.

There is little or no change to note in the condition of business. Orders are in some cases reported as coming in pretty freely, but the report of dull trade is very general. The adjournment of Congress will remove one of the causes of uncertainty, and the business community will experience a feeling of relief if it shall occur without any mischievous action in the mean time.

Nails have been in fair request, and the market has shown more activity during the week than for some time past. Orders are booked freely at $3.25 ₱ keg for 10d. to 60d., and on larger orders a further reduction would probably be made. The card rate continues $3.40 net.

The manufacturers of Rivets have made an advance to discount 40 %. The American Screw Co. have issued the following discount sheet, in which, besides the advanced price on Rivets, they ask attention to the reduced quotations on Eagle Philadelphia Tire Bolts, Bay State Tire Bolts and Coach Screws:

Flat Head, Iron, Wood Screws	dis. 50&10 %
Round Head, Iron " "	45&10 %
Flat Head, Brass, " "	50&10 %
Round Head, Brass, " "	40&10 %

On Flat Head Blued 2½ % will be added to net amount of invoice.

*Iron Black, Iron Tinned	40 %
*Block and Carriage Rivets	40 %
*Rivets in Bulk	40 %
*Burrs	40 %

Philadelphia Pattern Tire Bolts, Best Quality.

Philadelphia list	75 %
Eagle Philadelphia Tire Bolts, ¾, 3-16 & ¼	60 %
Bay State Tire Bolts, common list	85&5 %
†Flat Head Iron Machine Screws	55 %
†Round Head Iron Machine Screws	50 %
†Fillister " " " "	45 %
†Flat " Brass " "	55 %
†Round " " " "	50 %
†Fillister " " " "	45 %
Taps for Machine Screws	35 %
Stove Bolts	40 %
Sink Bolts	40 %
Pointed Wires	40 %
Tapped Nuts	20 %
Hand-Rail Screws	70 %
Coach Screws (by the keg, 150 lbs.)	70 %

With special additional discounts for large quantities.

* Any party purchasing and receiving $250 worth or more of Iron Rivets and Burrs at above price during the six months ending June 30, or Dec. 31, shall be entitled to an additional discount of 7½ per cent. Freight paid to principal cities on or east of Mississippi River. † On Machine Screws, differing from regular standards, special prices will be given on application. Terms, cash, 30 days. Freight prepaid to New York, Boston, Philadelphia and Baltimore. Except on Rivets, freight is not prepaid to other cities than above mentioned, but will not exceed rates from New York City. Prices not guaranted, and subject to change without notice.

The Barnes Mfg. Co., Horace F. Sise, agent, are making a new heavy cast Bronze or Gun Metal Spring Pad Lock, with five tumblers and automatic bolt. The manufacturers say: "We claim for these Pad Locks weight, strength, safety and durability. The five closely racked tumblers allow them a great variety of changes, and the automatic or self-acting bolt renders them practically unpickable. They are thoroughly and carefully constructed and finely finished." The following are the list prices, subject to a discount of 40 per cent.:

	Per doz.
No. 676, Plain Lock, 5 Tumblers, 2 Keys each	$15 60
No. 678, Chain Lock, 5 Tumblers, 2 Keys each	18 60
Extra Keys to Lock, or Sample Key	2.40
Key Blanks	1.08

Plain Locks packed ½ doz. in a box. Chain Locks packed ¼ doz. in a box. Size of Lock, 2¼ inches.

We have received the following announcement:

PHILADELPHIA, March 1, 1883.

We have appointed Messrs. Newlin & Yardley, of Philadelphia, sole agents for the sale of our Files and Rasps in the United States, Canada and Mexico, and under the stamp of Marshall File Co. we will continue to warrant our goods to be of first quality in every respect. Having increased our works fourfold, we hope to be able to fill orders promptly. Yours respectfully,
STEINBECK BROTHERS.

A meeting of the Board of Directors of the Hardware Board of Trade, Limited, was held in their rooms, on Monday 19th inst., at which Mr. Cook reported that he attended a meeting called by the Chamber of Commerce, at which the Exchange and Commercial boards of this city were requested to appoint one of their members to act as a committee with the others to receive subscriptions from their various boards, and to distribute the same, in their discretion, among the sufferers by the floods at the West. The following resolution was then adopted:

"*Resolved*, That a subscription list for the relief of the sufferers by the floods in the

West be circulated by the Hardware Board of Trade, Limited, among the Hardware and Metal trade generally, and that the funds so collected by this board be placed in the hands of our representatives on that committee, for such distribution."

The following are the subscriptions received up to this time:

Eaton Cole & Bernham Co	$100
Bruce & Cook	100
J. L. Mott Iron Works	100
Coombs, Crosby & Eddy	25
H. R. De Milt	25
Hogan & Son	10
I. Belden	50
Wallace & Sons	50
Waterbury Brass Co	50
Weibush Hilger Hardware Co	50
McCoy & Sanders	20
Schoverling, Daly & Gales	50
Alfred Field & Co	50
Durrie & McCarty	50
Graham & Haines	50
John P. Moore's Sons	25
Maltby, Curtiss & Co	15
Hermann Boker & Co	50
C. E. Jennings & Co	25
The Livingston Horse Nail Co	50
Russell & Erwin Mfg. Co	50
Holmes, Booth & Haydens	50
E. J. Moore	100

The Humason & Beckley Mfg. Co. have just issued a new illustrated catalogue which presents their line of goods in a very clear and attractive form. It begins with their line of Hammers, which has been very much extended. This company are paying particular attention to this line, for the extension of which they have made a considerable addition to their factory. A large share of the book is taken up by their Pocket Cutlery, the illustrations of which are very fine, and, being all full size, give a very clear idea of the goods. The book is well arranged, and the engravings, paper and printing are excellent.

We revise our quotations of wire as follows:

Brass and Copper	dis. 30 %
Market, Bright and Annealed	52½ @ 55 %
Market, Coppered	47½ @ 50 %
Market, Galvanized	42½ @ 45 %
Market Tinned, Tinned list	45 @ 47½ %
Stone, Bright & Annealed, Nos. 16 to 18	52½ @ 55 %
Stone, Bright & Annealed, Nos. 19 to 26	60 @ 62½ %
Stone, Bright & Annealed, Nos. 27 to 36	65 @ 67½ %
Stone, Galvanized, Nos. 19 to 30	42½ @ 45 %
Stone, Tinned, Tinned list	45 @ 47½ %
Tinned Broom Wire	55 @ 57½ %
Cast-steel Wire	45 @ 47½ %
Annealed Fence, Nos. 8 and 9	52½ @ 55 %
Annealed Grape, Nos. 10 to 14	52½ @ 55 %

Horace F. Sise, their New York agent, has furnished us a copy of the new illustrated catalogue of the Penn Hardware Co., of Reading, Pa., which is a neat and well-printed quarto of about 150 pages. There are many new goods shown in this catalogue, among which we notice a line of Sash Fasts, Sash Lifts, Drawer Pulls, Tower and Barrel Bolts and others. The following are their present prices and discounts.

PRICE LIST AND DISCOUNT SHEET TO CATALOGUE, 1883.

Page in Catalogue.

1–3 .... Apple Parers .... net

	Penn.	Triumph Halver.	Triumph Quarterer.
Per dozen,	$6.00	6.00	7.00

4–6 .... Lemon Squeezers .... dis. 40 %

Nos	1	2	3
Per dozen	$15.00	9.00	5.00

7–9 .... Pulleys, Frame, Penn Patent .... dis. 35 %

Inches	1¾	2	2¼
Per dozen	$0.48	.52	.70

10–35 .... Pulleys, Frame .... dis. 30 %

Nos	5	6	9	10	12	112
Per doz.	$0.29	.33	.29	.31	.40	.43
	13	113	15	115	16	116
	$0.50	.53	.41	.45	.46	.51
	17	117	18	118	25	225
	$0.57	.64	.90	1.00	.41	.45
	26	226	27	227	28	228
	$0.46	.51	.57	.64	.90	1.00
	79	89	80	90	85	95
	$0.85	.92	.94	1.00	1.14	1.20
	86	96	7	100	105	110
	$1.34	1.40	.40	.55	.60	.70
	200	205	210	37	42	22
	$0.60	.65	.75	.55	.70	.90
	222	222	23	123	223	24
	$1.00	1.20	1.10	1.20	1.40	1.60
	124	224	60	160	260	
	$1.75	1.95	1.55	1.80	2.00	

36, 37 .... Pulleys, Axle .... dis. 30 %

Nos	50	40
Per doz	$0.42	.45

Pulleys in Bulk, Fronts not Painted, 3 cents less on List.

38 .... Pulleys, Side .... dis. 65 %

Inches	1	1⅛	1¾	2
Per doz	$0.90	1.00	1.20	1.60
	2½	3	4	5
	$2.40	3.50	9.00	15.00

39 .... Pulleys, Upright .... dis. 65 %

Inches	1¾	2	2½	3
Per doz	$1.10	1.30	2.50	4.00

40 .... Pulleys, Screw, Single .... dis. 65 %

Inches	1	1¼	1½	1¾	2
Per doz.	$0.55	.60	.68	.82	1.10
	2¼	2½	3	4	5
	$1.40	1.60	2.25	6.00	10.00

40. Pulleys, Screw, Double, per doz., 1¾ inch. $1.50 .... dis 65 %

41–52 .... Hooks, Hat and Coat .... dis. 55 %

Nos	075	080	75	80	76
Per gross	$1.90	1.90	2.10	2.10	2.25
	81	77	82	400	405
	$2.25	2.60	2.60	1.35	1.35
	410	415	420	425	430
	$1.60	1.60	1.80	1.80	2.22
	435	60	65	4	14
	$2.22	2.30	2.30	2.20	2.20
	20	25	30	40	50
	$2.78	2.78	5.50	6.25	7.25
	100	105	200	205	300	305
	$4.15	4.15	6.00	6.00	7.00	7.00
	310	315	180	185	190	195
	$11.00	11.00	2.78	2.78	3.50	3.50

53–55 .... Hooks, Wardrobe .... dis. 55 %

Nos	0	00	1	01
Per gross	$1.65	1.65	1.85	1.85
	2	02	3	03	5	10
	$1.70	1.70	2.20	2.20	2.70	2.70

56, 57 .... Hooks, Ceiling .... dis. 40 %

Nos	110	115	120
Per gross	$1.50	1.50	1.60
	125	130	135	140	145
	$1.60	2.10	2.10	1.85	1.85

58, 59 .... Hooks, School House .... dis. 40 %

Nos	150	155	160	165
Per gross	$4.00	4.00	4.50	4.50

60 .... Hooks, Clothes Line .... dis. 65 %

Nos	5	15	10	20
Per doz	$0.75	1.50	0.75	1.50

61–63 .... Hooks, Harness .... dis. 55 %

Nos	261	262	265	270	260
Per doz.	$1.24	1.40	1.50	1.75	6.70

64 .... Hooks, Hat Rack and Backs .... dis. 30 %

Nos	40	45	175
Per lb	$0.11	.11	.11

65 .... Sliding Door Sheaves .... dis. 55 %

Iron Axle, inch	3	4	5
Per set	$1.00	1.30	1.70
Brass Axle, inch	3	4	5
Per set	$1.30	1.60	2.00

66. Sliding Door Rail, per 100 ft., No. 5, $8 .. dis. 55 %

66. Sliding Door Stops, per dz., No. 5, $0.57 .. dis. 55 %

67, 68 .... Barn Door Hangers .... dis. 55 %

Nos	4	5	6	8
Per doz. pairs	$5.50	7.00	9.00	11.75
	51	52	53	54
	$6.00	9.00	12.00	15.00

69 .... Barn Door Hangers .... dis. 50 %

Nos	61	62	63	64	65
Per doz. pairs	$7.00	9.00	11.50	13.50	17.00

70 .... Barn Door Rail .... dis. 25 %

Nos	0	1	2	3	4	6
Per 100 feet	$3.00	3.75	5.00	3.00	3.50	4.00

71 .... Barn Door Stays .... dis. 55 %

Nos	1	2
Per doz	$2.00	2.00

72 .... Barn Door Pulls .... dis. 50 %

Nos	1	2
Per doz	$0.76	1.22

73 .... Barn Door Rollers .... dis. 33⅓ %

Nos	34	35	36	38	40	42
Per pair	$0.30	.40	.55	.75	1.00	1.30

74, 75 .... Hay Fork Pulleys .... dis. 50 %

Nos	5	10	15
Per doz	$4.75	4.75	4.50

76 .... Well Wheels .... dis. 50 %

Inch	8	10	12	14
Per doz	$6.00	8.40	11.00	16.75

77 .... Family Grindstones .... dis. 20 %

Inch	6	7	8
Per doz	$10.00	12.00	14.00
9	10	11	12
$17.00	20.00	24.00	28.00

78 .... Grindstone Fixtures .... dis. 55 %

Nos	22½	23	23½	24	24½	25
Pr. dz. sets	$9.00	10.00	11.00	13.80	14.80	17.00

79 .... Grindstone Fixtures .... dis. 33⅓ %

Inch	15	17	19	21	24	28
Pr. dz. sets	$10.00	11.00	12.00	13.00	14.00	16.00

80–82 .... Bed Fasts .... dis. 60 %

Nos.	8	20	5	10	12
Per lb	$0.10	.10	.10	.10	.10

83 .... Casters, Bed .... dis. 40 %

Nos	1⅝–1	1⅝–2	1⅝–3
All Iron, per set	$0.11	.12	.14
Wood Wheel, per set	.11	.12	.14
Porcelain Wheel, per set	.16	.17	.20
Lignumvitæ Wheel, per set	.18	.20	.23
Nos	2–1	2–2	2–3
All Iron, per set	$0.16	.18	.20
Wood Wheel, per set	.16	.18	.20
Porcelain Wheel, per set	.22	.24	.26
Lignumvitæ Wheel, per set	.25	.28	.32

84 .... Casters, French .... dis. 40 %

Nos	2	3	4	5	6
All Iron, per set	$0.12	.13	.15	.16	.18
Porcelain Wheel, per set	.15	.17	.19	.20	.22
Lignumvitæ Wheel, p.s.	.17	.19	.22	.23	.26

85 .... Casters, Globe .... dis. 40 %

Size, inch	1⅝	2
Wood Wheel, per set	$0.22	.33
Porcelain Wheel, per set	.26	.40
Lignumvitæ Wheel, per set	.30	.45

86 .... Casters, Organ .... dis. 55 %

Nos	100	105	110
Per 100	$5.00	5.00	7.00

87 .... Casters, Piano Forte .... dis. 35 %

Iron Wheel, Nos	120	220
Per set	$0.60	.70
Brass Wheel, Nos	125	225
Per set	$1.25	1.50

88 .... Casters, Store Truck .... dis. 45 %

Nos	5	10	15
Per set	$1.00	1.60	2.00

89, 90 .... Window Shade Brackets .... dis. 55 %

Nos	50	50½
Per gross	$2.25	3.85

89, 90 .... Roller Ends .... dis. 55 %

Without Thimbles, Nos	51	52
Per gross	$3.60	5.50
With Thimbles, Nos	51	52
Per gross	$4.00	6.30

91 .... Window Shade Racks .... dis. 33⅓ %

Nos	5	10
Per gross	$1.60	2.25

92 .... Brackets, Store Shelf .... dis. 50 %

Nos	1	2	3	4	4½	5	
Per doz. pairs	$0.86	1.20	1.80	2.46	3.40	3.62	
6	6¼	6½	7	8	9	10	11
$4.75	5.25	5.65	5.75	5.10	8.00	10.25	11.75

93 .... Brackets, Penn Standard .... dis. 50 %

Nos	700	705	710
Per doz. pairs	$2.60	3.16	4.14
715	720	725	730
$5.20	7.10	9.25	10.50

94 .... Bolts, Shutter .... dis. 60 %

Inch	5	6	8	10
Per doz	$0.95	1.62	2.25	2.90

94 .... Shutter Catches .... dis. 60 %

Nos	20	120
Per gross	$4.50	6.00

95 .... Bolts (Brass Knob), Barrel .... dis. 55 %

Inches	3	4	5	6	7	8
Per doz	$1.00	1.12	1.45	1.80	2.12	2.45

96 .... Bolts, Tower .... dis 55 %

Inches	4	5	6	7	8
Per doz	$0.90	1.12	1.45	1.75	2.12

97–101 .... Thumb Latches .... dis. 50 %

Nos	1	2	3	4	
Per doz	$0.84	.96	1.10	1.30	
101	102	103	104	6	106
$1.54	1.66	1.80	2.00	0.80	1.50
8	108	9	109	95	100
$1.00	1.70	1.40	2.10	1.75	2.00

102–105 .... Barn Door Latches .... dis. 50 %

Nos	11	011	12	012
Per doz	$1.25	2.25	2.70	3.70
	20	020	25	025
	$1.50	2.50	2.95	3.95

106 .... Door Pulls .... dis. 60 %

Nos	150	155	159	160
Per doz	$0.55	.55	.70	.85

107 .... Door Buttons .... dis. 60 %

Nos	1	2	3	4
Per gross	$1.00	1.20	1.50	2.20
	11	12	13	14
	$3.50	4.10	4.70	6.00

108, 109 .... Drawer Pulls .... dis. 50 %

Nos	5	10	15	20	2	
Per gross	$4.25	4.75	4.50	5.00	2.00	
4	12	14	22	24	25	30
$2.25	2.50	2.85	3.25	3.75	5.00	5.50

110 .... Sash Lifts .... dis. 55 %

Nos	150	155	160	165
Per gross	$3.50	4.00	3.50	4.00

111, 112 .... Sash Fasteners .... dis. 45 %

Nos	1	5	3	4
Per doz	$0.44	.50	.55	.80

113 .... Sash Locks .... dis. 55 %

Nos	3	4
Per gross	$1.60	2.00

113. Bolts, Drop Cupboard, per gross, No. 4, $3.10 .... dis. 50 %

114, 114A .... Cupboard Catches .... dis. 35 %

Nos	300	305		
Per gross	$7.00	8.50		
310	315	320	325	330
13.00	14.50	16.00	15.00	16.00

114 B .... Cupboard Turns .... dis. 40 %

Nos	350	355
Per doz	$2.40	2.95

115 .... Shutter Bars .... dis. 50 %

Nos	150	155	160	165
Per doz	$0.38	.44	1.05	1.20

116, 117 .... Hinges, Surface Blind .... dis. 50 %

Nos	3	4
Per doz. pairs	$1.10	2.00

118–120 .... Turnbuckles .... dis. 45 %

Nos	2	12	3	
Per gross	$6.75	13.00	16.50	
13	0	10	1	11
27.00	5.75	10.50	6.50	12.00

121, 122 .... Sash Centers .... dis. 40 %

Nos	50	100	150
Per gross sets	$4.00	5.00	12.00

123 .... Porch Irons .... dis. 50 %

Nos	1	2	1	2
Per doz	$1.80	1.80 per lb.	$0.10	0.10

124 .... Chest Handles .... dis. 50 %

Nos	5	10	15
Per doz pairs	$2.00	2.60	3.70

125 .... Tea Pot Stands .... dis. 55 %

Nos	37	38	39
Per doz	$1.20	1.80	2.20

125 .... Brackets, Flower Stand .... dis. 45 %

Nos	200	205	210	215
Per doz. sets	$4.40	4.40	8.00	8.00

127–129 .... Lamp Stands .... dis. 40 %

Nos	100	101	102	300	301
Per doz	$3.00	3.00	3.00	5.50	5.50
302	303	400	401	402	403
$5.50	5.50	7.00	7.00	7.00	7.00

130 .... Lamp Brackets .... dis. 40 %

Nos	125	135	145	155
Per doz	$5.00	5.00	5.00	6.50

131. Nippers, Toy Cutting, per gross, No. 0, $7 .... dis. 55 %

132. Plyers, Toy Flat, per gross, No. 1, $6 .. dis. 55 %

133 .... Iron Jacks, Toy .... dis. 55 %

Nos	0	1	2
Per great gross	$3.00	3.50	4.25

133. Sad Irons, Toy, ℔ grs, No. 109, $2.20 .. dis. 55 %

134, 135 .... Banks, Toy Savings .... dis. 40 %

Nos	500A	550	560	500P
Per doz	$3.00	3.00	3.25	3.50

136 .... Paper Weight and Blotter .... dis. 40 %

Nos	50	60	70
Per doz	$7.00	7.00	7.00

136 .... Ink Tops .... dis. 45 %

Nos	100	105	110
Per gross	$9.00	9.00	9.00

137–141 .... Inkstands .... dis. 40 %

Nos	10 to 19 inc.	20 to 29 inc.
Per doz	$4.50	9.00
30 to 39 inc.	50 to 59 inc.	60 to 69 inc.
$6.50	12.50	14.00

We last week referred to a remarkable bill introduced in Congress to extend the Wringer patent of John Young for a further term of seven years. The text of the bill is as follows:

A BILL for the relief of the heirs of John Young.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the heirs of John Young, of Amsterdam, New York, be, and they hereby are, authorized to apply to the Commissioner of Patents for the extension for a further term of seven years of his letters patent for improved washing and wringing machine, originally granted on the nineteenth day of September, eighteen hundred and forty-eight, as reissued to him in two divisions, dated January sixth, eighteen hundred and sixty-three, and numbered, respectively, thirteen hundred and eighty-four and thirteen hundred and eighty-five, the same as if said patent had not been once already extended; and that the Commissioner of Patents be, and is hereby, authorized to proceed upon, determine, and decide such application upon the same evidence and in the same manner as in other cases of applications for the extension of patents: *Provided*, That the application for extension be made within thirty days after the passage of this act: *And provided also*, That no person shall be held responsible in damages for the manufacture of articles containing such improvement between the expiration of said letters patent and the approval of this act.

IRON.

American Pig.—The position of the market has undergone no change during the past week, and business has been decidedly quiet. We hear of nothing doing except in a small way. The opinions expressed by the trade regarding the future of the market are generally of an encouraging nature, and it is held by many well-informed parties that business will undergo a revival during the next few weeks. We quote standard brands No. 1 X Foundry, $24.50 @ $25; No. 2 X Foundry, $22.50 @ $23, and Gray Forge, $19.50 @ $20.50, at tidewater.

Scotch Pig.—The demand for Scotch Irons appears to have been somewhat lighter than for some time past, and the business brought to our notice has been of a very retail character. We quote: Eglinton, $21.25 @ $22; Carnbroe and Glengarnock, $22 @ $22.50; Coltness, $24.50 @ $25; Gartsherrie and Langloan, $24.25 @ $25, and Summerlee, $24 @ $24.50.

Rails.—Both buyers and sellers of Steel Rails are still holding off, and there appears to be little disposition to urge business on either side. Orders for lots of a few hundred tons each are being booked from time to time, but orders for larger lots are few and far between. We quote $39 @ $40 at mill.

Old Rails.—Sales amounting to several hundred tons are reported to have been made at figures which are withheld. A lot of 200 tons was sold at $23.50, delivered on dock. The market is very irregular and difficult to quote exactly. Double Heads are quoted $27.50.

Scrap Iron—Is in light request and difficult to move even at heavy concessions. The position is entirely in buyers' favor. We hear of a sale of 1000 tons No. 1 Wrought at $26, part ex-ship and ex-store.

We notice the removal of James Williamson & Co. from 65 to 63 Wall street, New York.

The copartnership existing between Messrs. Mann & Jones, at 4 Hanover street, New York, has been dissolved by mutual consent, Mr. G. A. Mann retiring. Mr. Jones, with Mr. Edward McGarvey, will continue the Iron brokerage and commission business, under the name of G. W. Jones & Co., at the above address.

METALS.

Copper.—Our market has been moderately active, 150,000 ℔ Lake selling at 17¾¢ @ 17⅞¢, and 250,000 ℔ Baltimore on private terms. We quote: Lake Superior, 17¾¢ @ 17⅞¢; Anchor brand, 17¼¢; Star brand, 17¢; Baltimore, 16¢, and outside brands, 15¾ @ 16¢. Messrs. W. T. Sargant & Sons, London, February 5, made the visible supply in England and France on February 1, 43,156 tons, against 49,055 last year, 58,072 in 1881, 56,261 in 1880, 52,978 in 1879, and 44,383 in 1878. Per cable yesterday the quotation from there was £71 for Best Selected (£1 decline), and £65. 10/ Chili Bars. We are cabled from London to-day: "No improvement to note, market ruling dull, with prices weak. Best Selected, £71 @ £71. 10, and Chili Bars, £65 @ £65. 5/." Manufacturers have made no change in prices. They quote: Bottoms, 31¢ @ 32¢; Braziers', 30¢ @ 36¢; Circles, 33¢ @ 36¢; Sheathing, 28¢, and Bolt Copper, 30¢; Segment Sheets, 33¢; Fire-Box do., 30¢.

Tin.—Nothing of special interest has occurred in this market; the situation and prices remain the same. London came this morning with Straits Tin, £93. We are cabled from there to-day: "Market dull and prices a little lower. Straits Ingots, spot, £93 @ £93. 10/, and futures, £93. 15/ @ £94. 5/." The Batavia Billiton sale of the Government, yesterday, produced the average figure of 64.72 guilders ℔ picul. Messrs. W. T. Sargant & Sons, London, Feb. 5, made the visible supply in Europe and America on Feb. 1, 18,098 tons, against 17,494 tons last year. Messrs. William I. Russell & Co., New York, quote in their circular of this day last year's price of Straits on Feb. 28, 25⅛¢; 1881, 19¾¢; 1880, 22¾¢, and 1879, 15¼¢. We quote to-day, Straits, large lots, 20¾¢; jobbing, 21¢ @ 21⅛¢, and L. & F., 22¢. *Tin Plates.*—There is a steady and rather improved demand, but arrivals have been quite free. We quote large lots, ordinary brands, ℔ box, to-day: Charcoal Bright, $6 @ $6.50; ditto Ternes, $5.25 @ $5.50; Coke Tin, $5.10 @ $5.30, and ditto Ternes, $4.87½ @ $5. Liverpool is pretty firm; the market there is actually above our parity. We hear from London, per cable, that the market is quiet and quotations nominal. Liverpool came yesterday: Coke 15/9 @ 16/ and Charcoal, 18/6 @ 21/.

Lead.—The St. Joe, Bonne Terre, Mo., concentrating mills have been burned, and unless they get their work done at another works in the meantime, it will make a difference of 500 tons per month less for three months. Out West this has caused a little stiffening, but not here, this minus production being neutralized by the slack demand, so that for large lots of Common Domestic it would be difficult for the moment even to get $4.55, while smaller lots may be quoted $4.60 @ $4.65, nominally, for we hear of no sales during the week under review. At East St. Louis 300 tons Corroding Lead sold at equal to $4.65 here; it is difficult to get for Corroding an offer of $4.60 on the spot. From London we are cabled to-day: "Market dull and weak. Common English Pig, £13. 7/6 @ £13. 17/6." Manufactures are quoted as follows: Lead Pipe, 6¾¢; Sheet Lead, 7½¢; Tin-lined Lead Pipe, 15¢ ℔ ℔, and Block-tin Pipe, 45¢, less the usual discount to dealers.

Spelter and Zinc.—The same state of apathy described by us in almost stereotyped sentences for six weeks past has prevailed for the week, so that even at 4⅝¢ Common Domestic is not easily placed, while Silesian is nominally worth 5⅛¢. "Godulla," we see, sold at Breslau, Silesia, at 15 marks ℔ 50 kg. From London we receive the following cablegram this afternoon: "Demand small and prices steady. Ordinary at shipping ports, £15. 10/ @ £15. 15/." We quote Bertha Refined, 8¼¢ and Bergenport 9½¢. *Sheet Zinc* sells at 6¢ @ 6⅛¢.

Antimony—Is a little better held, at 10¢ @ 10½¢ Hallett, and 11¢ @ 11¼¢ Cookson, as to quantity.

COAL.

In the Anthracite Coal trade there is a slightly increased demand among the producing companies, attributed to recovery from the glut caused by one week of full time at the mines, which is declared to have been "a bad thing." No general revival will be looked for before April 1st, by which time the opening prices for the spring will probably take effect. Some sort of understanding on this point will be reached by the 20th, though without a formal agreement. Although prices remain nominally as given in the October circulars, the "cuts" have all along averaged 50¢ @ 60¢ below, the Best Lehigh alone excepted. According to Philadelphia authority, "such iron works as have suspended are not important Anthracite consumers, and the companies will probably take good care that the rest shall not suspend on account of the high price of coal."

The Bituminous trade is at a standstill—"demoralized," according to trade parlance—owing to the imposition of increased tolls from the mines to Amboy. The rate is said to be $2.90 per ton, net, and the supposition is that the Baltimore and Ohio Company will announce a uniform rate from the Maryland State line, to take effect at once. The figure above given is 5¢ advance on last year.

Eastern shipments are improved, at $1.25 to Boston and 80¢ to Providence.

The total amount of Anthracite mined thus far in the year 1883 is 3,219,968 tons, compared with 2,866,105 tons for the same period last year, an increase of 353,863 tons. The survey of the New York, Lake Erie and Western Company's new route to the Anthracite Coal regions was completed last week.

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	℔ ℔. $	...	@	0.14½
" light	"	...	@	.13
Copper Bottoms	"	.13	@	.13
Yellow Metal	"	.09	@	.09½
Brass, heavy	"	.09½	@	...
Brass, light	"	.08½	@	...
Composition, heavy	"	.15	@	...
Lead, heavy	"	.03¾	@	...
Tea Lead	"	.03¾	@	...
Zinc	"	.03	@	...
Pewter, No. 1	"	.14	@	.15
Pewter, No 2	"	.10	@	...
Wrought Iron	℔ ton.	22.50	@	...
Light "	"	12.00	@	13.00
Stove Plate	"	12.00	@	...
Machinery do	"	...	@	15.00
Grate Bars	"	4.50	@	...
Electrotype Plates	℔ ℔.	0.4	@	0.4¼
Stereotype Plates	"	.05	@	...
Small type	"	.04½	@	.04¾

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	℔ ℔,	3½c.	@	4 c.
White Cotton, New	"	3½c.	@	....
" No. 2	"	2¼c.	@	2½c.
White, No. 1	"	4 c.	@	4¼c.
" No. 2	"	2 c.	@	2¼c.
Seconds	"	½c.	@	1 c.
Soft Woolens	"	6 c.	@	7 c.
Mixed Rags	"	1¾c.	@	2 c.
Gunny Bagging	"	1¾c.	@	....
Jute Butts	"	1½c.	@	1¾c.
Kentucky Bagging	"	...	@	3¾c.
Book Stock	"	2 c.	@	2¼c.
Newspapers	"	1 c.	@	....
Waste Paper and Scraps	"	¼c.	@	....
Kentucky Bale Rope	"	3½c.	@	4 c

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending February 27, 1883:

Hamburg.

	Quan.	Val.
Knit'g mach., cs	6	$925
Blower	1	40
Hdw., pkgs	33	1,144
Wringers, cs	12	366
Clocks, pkgs.	19	1,582
Mach'y. pkgs.	2	1,010
Iron case	1	50
Pumps, pkge.	1	106
Ag. imp.,pkgs	17	955
Arms, cs	2	327
Mf. iron, pkgs	243	1,792
Saws, case	1	158
Sew ma., cs	579	7,426
Rifles, cs	100	15,218

Bremen.

Ptm., gls.	1,163,165	91,200
Ag. imp., pkgs	816	6,712
Mf. zinc, bxs	20	180
Scales, cs	8	186
Hdw.. pkgs	156	3,620
Mf. iron, pkgs	12	566
Saws, cs	4	242
Mch'y, pkge	1	225

Antwerp.

Rifles, cs	3	375
Ptlm., gls.	1,222,905	95,200
Ag. imp, pkgs	2	129
Mf. iron, pkgs	4	95

Rotterdam.

Ptlm., gals.	253,077	19,488

Danish West Indies.

Tubes	100	198
Nails, kegs	20	71
Ptlm., gals	500	61

Dutch East Indies.

Ptlm., gals.	905,100	96,685
Nails, kegs	200	630
Mf. iron, pkgs	15	175

Elsinore.

Ptlm., gals.	229,264	18,928

Glasgow.

W. metal, cs	10	400
Hdw., pkgs	2	70
Mach'y, pkgs.	3	211

Havre.

Ptlm., gals.	574,116	40,905
Ag. imp., pkgs	724	15,825

Liverpool.

Hdw., pkgs	44	1,511
Clocks, pkgs	500	10,231
Ore, bxs	2	60
Stl. plts., cs	6	275
Compasses, cse	1	36
W. mills, pkgs	3	65
Z., dross, cks.	21	150
S. evap'tors, cs	10	876
Pumps, pkgs	18	997
Copper, cks	70	14,824
Mf. iron, pkgs	22	260
Pistols, cs	4	600
Ag. imp., pkgs	14	356
Mach'y pkgs.	6	565
Cutlery, case.	1	125
Sew. ma., cs	100	1,500
Ptg press's, cs	2	70

Hull.

Ag. imp., pkgs	51	1,863
Scales, bxs	431	10,634
Hdw., cs	3	94
Clocks, pkgs	11	265

Bristol.

Clocks, pkgs.	27	311

Dublin.

Ptlm., gals.	167,229	11,476

London.

Eyelets, cs	22	777
Guns, cs	30	7,200
Sew. ma., cs	855	13,357
Clocks, bxs	19	828
Nails, cs	9	90
Mf. iron, pkge	1	160
Ptlm., gals.	357,548	28,369
Ag. imp., pkgs	202	2,088
Hdw., pkgs	8	395
Iron safes	11	1465

British West Indies.

Scales, bxs	60	741
Mach'y, pkgs	14	1,289
Mf. iron, pkgs	25	367
Sew. ma., cs	22	538
Iron sa e	1	112
Revolvers, cse	1	40
Clocks, cs	3	89
Anchors	6	43
Ptlm., gals.	53,412	6,113
Hdw., pkgs	57	749
Ag. imp., pkgs	6	60
Nails, kegs	48	197
Pumps, pkgs.	3	34
Nails, bxs	35	267

New Zealand.

Ptlm., gals.	24,960	3,716
Mach'y, pkgs.	25	2,933
Hdw., pkgs	328	5,430
Presses, case.	1	70
Pumps, pkgs.	11	421
Nails, cs	15	423
Mf. iron, pkgs	53	597
Cutlery, cs	3	34
Scales, cs	17	365
Sew. ma., cs	30	865
Ag. imp., pkgs	128	2,118
Wringers, cs.	5	95
Saws, cs	4	165
Clocks, cs	5	81

British Possessions in Africa.

Nails, kegs	150	725
Hdw., pkgs	43	1,175
Mf. iron, pkgs.	63	225
Ptlm., gals	48,800	6,440
Ag. imp., pkgs	2	60

British Australia.

Hdw., pkgs	150	2,014
W. mills, pgs.	13	477
Nails, cs	5	103
Clocks, case	1	94
Ag. imp., pkgs	2	90
Mf. iron, pkgs	106	925
Ptlm., gals	9600	1,300
Pumps, pkgs.	7	280

British Guiana.

Ptlm, gals	10,000	1,200

Hong Kong.

Cartridges, cs.	3	90
Hdw., case	1	53
Scales, cs	4	80

British East Indies.

	Quan.	Val.
Ptlm., gals.	473,000	50,848

Cuba.

Ptlm., gls.	105,856	10,214
Hdw., pkgs.	176	2,938
Mach'y, pkgs.	73	3,580
Pumps, pkgs.	9	405
Nails, bxs	26	119
Tinfoil, box	1	18
Metal, bxs	6	524
Cutlery, cs	3	235
Ag. imp., pkgs	40	1,174
W. mills, pkgs	8	206
Mercury, flks.	3	89
Nails, kegs	59	226
Copper, sheets	2	193
Mf. iron, pkgs	142	2,234
Scales, cs	27	483
Tin, bxs	12	158
Spikes, kegs	67	288
Iron, bdls	12	98
Clocks, cs	9	288
Br. g'ds, cs	4	157
Sew. ma., cs	12	180
Valves, case	1	90
Boilers	2	4,000
Iron safe	1	200

French Guiana.

Ptlm., gals	2000	225

Hayti.

Mach'y, pkgs.	10	380
Ag. imp., pkgs	4	102
Chains and a., pair	1	58
Cotton gins, cs	5	136
Ptlm., gals.	7895	915
Hdw., pkgs	9	111
Mf. iron, pkgs.	11	201
Cot. presses	3	461
Nails, kegs.	14	59
Sew. ma., cs	9	114
Iron, pkgs	87	53

Santo Domingo.

Ptlm., gals	5250	835
Iron, pkgs	28	48
Hdw., pkgs	62	1,136
Nails, kegs	54	190
Mach'y, pkgs.	31	1,030
Sew. ma., cs	15	375
Pumps, pkgs.	3	18
Nails, cs	5	66
Cutlery, cs	3	57
Mf. iron, pkgs	102	487
Buckles, case	1	53
Clocks, pkgs.	7	62
Scales, cs	4	160
Valves, cs	2	21

Central America.

Cutlery, cs	12	457
Mf. iron, pkgs	108	959
Sew. ma., cs	21	489
Hdw.. pkgs	49	734
Iron bars	20	33
Copper, case	1	37
Nails, kegs	22	83
Br. g'ds, pkge.	1	27
Scales, cs	2	22
Stampedware, case	1	180
Ptlm., gals	3629	388
Arms, pkgs	4	201
Boiler	1	196
Shot, bxs	7	101
Nails, bxs	22	149
Mach'y, pkgs.	2	192
Iron safe	1	50
Shot, bags	37	234
Ag. imp., pkgs	6	21
Bell	1	14

Porto Rico.

Mf. iron, pkgs	149	710
Mach'y, pkgs.	22	15
Clocks, pkgs	5	103
Water closets.	6	208
Iron safes	3	435
Hdw., pkgs	19	680
Ptlm., gals	7349	1,557
Scales, cs	14	430
Ag. imp., pkgs	11	250
Stmpdwre, cs	2	34
Mf. iron, pgs.	43	22
Sew. ma., case	1	18
Nails, cs	3	24

Mexico.

Clocks, pkgs	87	1,642
Mf. iron, pkgs	759	3,077
Cutlery, cs	61	1,369
Ptlm., gals	102,450	11,822
Nails, kegs	84	301
Shot, bags	20	29
Railroad wh'ls, pairs	204	4,701
Firearms, cs	12	1,827
Iron, pkgs	3	36
Pumps, pkgs	20	1,023
Spikes, kegs	80	395
Railroad cars.	86	39,626
Nails, cs	3	39
Per. caps, cse	1	25
Zinc, cask	1	44
Hdw., pkgs	513	6,730
Scales	16	58
Sew. ma., cs	241	5,168
Ag. imp., pkgs	165	3,459
Cartridges, cs.	38	568
Mach'y, pkgs.	538	35,351
Br. goods, cse	1	80
Tin plate, cs	61	363
Tacks, cs	8	351
Iron safes	5	790

Venezuela.

Mach'y, pkgs.	22	530
Hdw., pkgs	42	420
Cartridges, cs	12	200
Sew. ma., cs	24	464
Revolvers, cs	2	325
Cutlery, case	1	70
Ptlm., gals	2000	215

Genoa.

Ptlm., gals.	130,700	9,750

Lisbon.

Ptlm., gals.	52,400	3,940

United States of Colombia.

Hdw., pkgs	443	4,965
Arms, cs	38	6,779
Cartridges, cs	11	209
Nails, kegs	35	151
Gun caps, cse.	1	30
Ag. imp., pkgs	158	1,639
W. rope, bbl.	1	43
Zinc, cks	17	602
Tin, cs	15	108
Locomotives	3	26,200
Y. metal, bars	30	103
Steel rails	500	4,608

	Quan.	Val.
Ptlm., gals.	16,668	2,092
Mf. iron, pkgs.	1007	5,034
Sew. ma., cs.	185	4,610
Mach'y, pkgs.	197	17,729
Cutlery, cs.	175	3,463
Scales, cs.	62	724
Revolvers, cs.	4	216
Iron, pkgs.	177	328
Pumps, pkgs.	8	320
Clocks, pkgs.	10	272
Ld. pipe, coils	20	235
Solder, bxs.	2	93
Ammunition, pkgs	55	956
Nails, box	1	28
Valves, cs.	3	157
Sugar mills	2	164
Brass g'ds, cs.	9	271
Boiler	1	1,461
Spikes, kegs	50	293
Shot, bxs	7	67
Copper sti l	1	600
Coal tubs	6	360
Anchors	20	713

Brasil.

Ptlm., gals.	79,582	8,561
Pumps, pkgs.	4	155
Cutlery, cs.	11	349
Mach'y, pkgs.	76	7,732
Stmpdwre, cs.	7	180
Wire, cs.	22	2,000
Nails, kegs	100	305
Hdw., cs.	55	794
Mf. iron, pgs.	109	1,418
Sew. ma., cs.	30	1,000
Tacks, cs.	12	135
Iron, cs.	76	390
Ag. imp., pkgs	52	220
Clocks, pkgs.	29	648
Rifles, cs.	3	281
S. ma. oil, cs.	4	18
Revolvers, cse	1	32
Cartridges, cse	1	10

New Brunswick.

	Quan.	Val.
Ptlm., gals.	750	113
Mf. iron, pkgs.	7	12

Bordeaux.

Ptlm, gals.	251,518	17,920
Naph., gals.	51,810	4,915

St. Loubes.

Ptlm, gals.	263,331	19,000

French Possessions in Africa.

Ptlm. gals.	143,000	14,300

French West Indies.

Sew. ma., cse	1	15
Hdw., cs.	3	90
Clocks, bxs.	2	17

Seville.

Ptlm., gals.	185,000	17,100

Alicante.

Ptlm., gals.	97,504	7,200

Spanish Possessions in Africa.

Ptlm., gals.	10,000	1,225
Sugar mill	1	140

China.

Ptlm., gals.	687,780	74,904

Japan.

Firearms, cse.	1	79
Cartridges, cs	10	300
Br. shells, cs.	286	5,148
Bell	1	45
Revolvers, cs.	4	343

Sandwich Islands.

Mach'y, pkgs.	14	2,560

IMPORTS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending February 28, 1883.

Hardware.

Atlas S. S. Co.
Cases, 30
Casks, 2
Brown, Shipley & Co.
Cases, 2
Blanche H. T.
Engine, case, 1
Berbeck J. & Co.
Packages, 4
Baldwin Bros. & Co.
Gun barrels, cs., 10
Blumenthal B. & Co.
Case, 1
Boker Hermann & Co.
Hdw., cutlery, &c., pkgs., 48
Bloom N.
Case, 1
Chapman H. S.
Machinery, cs., 5
Castle S. A. & Co.
Cases, 7
Clark Thread Co.
Mach'y, pkgs., 277
Codd H. & Co.
Machinery, case, 1
Curley J. & Bros.
Case 1
Cutlery, case, 1
Degrauw, Aymar & Co.
Chains, lengths, 2
Field Alfred & Co.
Mdse., cs., 30
Chains, cks., 38
Anvils, 170
Cutlery, cs., 5
Folsom H. & D.
Arms, cs., 4
Mdse., cs., 10
Greenmount Spinning Co.
Mdse., pkgs., 7
Graef Cutlery Co.
Cases, 4
Chains, cks., 11
Mdse., cs., 6
Grinnell Minturn & Co.
Machinery, pcs., 40
Huermann W.
Machinery, case. 1
Hammacher A. & Co.
Screws, saws and tools, cs., 10
King H.
Cases, 5
Ludwig E.
Machines, cs., 9
Merchants' Dis. Co.
Arms, cs., 3
Ironware, case, 1
Moore's J. P. Sons
Mdse., cs, 20
Moss F. W.
Files, csks., 7
Mott Iron Works,
Washtubs, crates, 80
Niles Tool Works,
Mdse., cs., 12
Noyes, Smith & Co.
Cases, 4
Peters & Calhoun,
Packages, 3
Risley & Kerrigan,
Nails, cs, 22
Schoverling, Daly & Gales,
Arms, cs., 7
Mdse., cs, 31
Struller, Lau & Co.
Arms, cs., 4
Taylor Thos.
Mdse., cs, 5
Thompson John,
Cases, 2
Vom Cleff & Co.
Mdse., cs., 17
Waefelaer & Wood,
Iron hook nails, csks., 91
Ward Alsine,
Mdse., cs., 4
Wiebusch, Hilger & Co.
Hdw., cutlery, guns, pkgs., 63
Witte John G. & Bro.
Cutlery, cs., 2
Order,
Files, cks., 13
Chains, csks., for Chicago, 11
Chains for Chicago, 188
Casks for Chicago, 2
Cases for Chicago, 5
Chains, csks., 10
Machinery, cs., 14
Anvils, 34
Cases, 8
Machinery for Canada, pkgs., 51
Cases for Canada, 10
Packages for Canada, 4
Cutlery, case, 1

Iron.

Abbott Jere & Co.
Bar ends, cs., 120
Pig, tons, 100
Addie Robert & Co.
Pig, tons, 100
Alexandre F. & Sons,
Barrels, 59
Bundles, 114
Baring Bros. & Co.
Nail rods, 2025
Bars, 5769
Wire rods, coils, 422
Wire rods, bdls., 560
Bond, Parsons & Co.
Pig, tons, 109
Brown Bros. & Co.
Wire rods, coils, 755
Coddington T. B. & Co.
Sheet, bdls., 267
Crocker Bros.
Pig, tons, 200
Drexel, Morgan & Co.
Pig, tons, 475
Dalmallington Iron Co.
Pig, tons, 100
Garnshaw Alfred,
Ore, tons, 1531
Iron Clad Mfg. Co.
Scraps, pkgs., 130
Irwin Richard & Co.
Pig, tons, 400
Junge F. W.
Castings, pkge., 1
Lang W. Bailey,
Bundles, 30
Lee Jas. & Co.
Pig, tons, 200
Ladenburg, Thalmann & Co.
Gal. wire rings, 331
Lundberg Gust.
Bars, 5936
Bundles, 331
Coils, wire, 246
Merchants' Dis. Co.
Bars, 302
Bundles, 190
Morgan W. D.
Galv. iron, cs., 37
Sheets, bdls., 261
Canada plates, bxs., 200
Naylor, Benzon & Co.
Bundles, 96
Bars, 1226
Perkins & Choates,
Iron in bulk, lbs., 100,000
Cases, 1050
Phillips C. A. Co.
Ironwork, case, 1
Tillottson L. G. & Co.
Coils, wire, 421
Wood, Niebuhr & Co.
Wire rings, 772
Whitney A. R.
T-iron, bars, 378
Plates, 14
Williams H. E
Oxide, cks., 105
Williamson J. & Co.
Pig, tons, 300
Order,
Pig, tons, 694
Ore, tons, 571
Bars, 13,042
Boiler tubes, 125
Wire rods, csks., 14
Boiler tube, pcs., 215
Scrap, tons, 413
Scrap, bags, 1070
Scrap, lot.
Scrap, kg., 257,350
Channel iron bars, 24
Old fish plates, lot.
Wire, bdls., 906
Plates, 4
Band iron, pcs., 738
Tubes, 230
Wire, case, 1
Bundles, 2616
Coiled rods, bdls., 1581
Hoops, bdls, 5002
Circular shts., bdls., 121
Sheet, bdls., 102
Sheets, 147
Rods, pkgs., 1863
Rods, bdls., 32,594
Galv. wire, coils, 266
Plates, bdls., 193
Wire, coils, 224
Wrought scrap, kg., 250,155
Old horseshoes, tons, 14
Bundles for Canada, 552
Pieces for Canada, 738
Bars for Canada, 5025

Steel.

Abbott Jere & Co.
Cases, 53
Bars, 2
Bowring Henry,
Axles, old, 62
Brown Wm.
Packages, 136
Brown Bros. & Co.
Wire rings, 3:00
Gt. Western Dis. Co.
Mdse., cs., 170
Joliet Steel Co.
Mdse., cs., 23
Ladenburg, Thalmann & Co.
Cases, 51
Wire rings, 377
Lalance & Grosjean,
Cases, 2
Mayer, Strouse & Co.
Casks, 16
Moss F. W.
Bundles, 292
Bars, 54
Roebling's Sons & Co.
Box, 1
Temple & Lockwood,
Cases, 17
Bundles, 36
Wagner W. F.
Bundles, 401
Bars, 54
Cases, 52
Wood, Niebuhr & Co.
Wire, pkgs., 1550
Packages, 1239
Order,
Boxes, 61
Packages, 169
Bundles, 2221
Cases, 2
Strips, csks., 30
Old leaf spring, tons, 199
Bands, 113
Bands, cs, 100
Forgings, 191
Rods, pkgs., 1676
Scrap, csks., 62

Metals.

Alkman Jas. & Co.
Tin plates, bxs., 400
Bond, Parsons & Co.
Tin plates, bxs., 970
Bank of Montreal,
Tin plts., bxs., 2815
Baring Bros. & Co.
Tin plts., bxs., 1000
Canadian Bank of Commerce,
Tin plts., bxs., 2000
Clement Louis L.
Metals, bbls., 3
Crooks R. & Co.
Tin plts., bxs., 1126
Doyle J. E. & Co.
Metallic capsules, cs., 7
Downing, Sheldon & Co.
Nickel, cask, 1
Dickerson, Van Dusen & Co.
Tin plts., bxs., 1492
Foote E.
Nickel alloy, cs., 15
Lamarche H. & Sons,
Rolled zinc, csks., 9
Meyer, G. A. & E.
Zinc oxide, bbls., 600
Morgan W. D.
Tin plts., bxs., 17
Mouquin H.
Met. caps, cs., 6
Phelps, Dodge & Co.
Tin plates, bxs., 12,110
Antimony, csks., 34
Robertson Jas.
Zinc oxide, bdls., 50
Stevenson, Pierson & Co.
Metal sheathing, cs., 30
Order,
Tin plts., bxs., 17,349
Terne plts., bxs., 110
Quicksilver, bottles, 300
Spelter, ingots, 1000
Slabs, 2301
Old zinc, pkgs., 235
Spelter, plts., 3321
Banca tin, slabs, 640
Tin taggers, bxs., 110
Antimony, cks., 16
Ingots, 3025

FOREIGN TRADE MOVEMENTS.

The following is a summary of foreign trade movements during the past week :

IMPORTS.

For the week ended February 23 :

	1881.	1882.	1883.
Total	$8,907,346	$11,175,252	$6,927,115
Prev. reported	51,343,429	65,283,801	62,798,486
Since Jan. 1	$60,250,775	$76,459,053	$69,725,601

Included in the imports were articles of merchandise valued as follows :

	Quan.	Value
Anvils	158	$1,336
Antimony	50	3,068
Brass goods	12	2,298
Bronzes	1	593
Clocks	9	728
Copper	..	2,194
Cutlery	38	10,046
Guns	35	7,730
Hardware	5	205
Iron, pig, tons	1,300	18,962
Iron, sheet, tons	12	934
Iron ore, tons	1,671	4,614
Iron, other, tons	609	14,686
Machinery	49	3,329
Metal goods	94	11,518
Needles	11	3,063
Old metal	..	3,083
Platina	2	6,597
Percussion caps	45	6,404
Pins	5	518
Plumbago	232	2,207
Saddlery	3	298
Steel	15,282	39,412
Steel blooms	1,323	7,356
Spelter	280,155	10,548
Tin, boxes	18,202	79,620
Tin, 3,583 slabs ; lbs	350,571	73,961
Wire	474	1,369
Zinc	110,230	4,523

The quantities of leading articles imported compare with previous dates as follows :

	For the week.	8 weeks of 1883.	Same time 1882.
Cutlery, pkgs.	38	1,168	1,236
Hardware, pkgs.	5	243	195
Iron, R. R., bars	..	40	29,929
Lead, pigs	....	103	3,086
Steel, pkgs	15,282	303,897	279,469
Tin, bxs.	18,202	259,475	409,798
Tin slabs, lbs.	350,571	3,223,926	658,304

EXPORTS OF SPECIE.

For the week ended February 24 :

Total	$411,638
Previously reported	1,836,254
Total since January 1, 1883	$2,247,892
Same time in 1882	8,702,740
Same time in 1881	1,902,792
Same time in 1880	1,370,502
Same time in 1879	3,073,166
Same time in 1878	2,151,029
Same time in 1877	2,899,814
Same time in 1876	7,888,281
Same time in 1875	13,555,802
Same time in 1874	5,566,279
Same time in 1873	11,235,942
Same time in 1872	2,810,367

EXPORTS EXCLUSIVE OF SPECIE.

For the week ended February 27 :

	1881.	1882.	1883.
Total	$8,528,255	$5,965,154	$5,909 490
Prev. reported	49.944,040	45,288,056	49,168,623
Since Jan. 1	$58,472,295	$51,253,210	$55,078,113

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth st., PHILADELPHIA, February 27, 1883.

Pig Iron.—The demand during the week, as might be supposed, has not been very large. The fact that there are only a few days more before Congress adjourns has caused buyers to hold off until something definite is known as to the tariff. The general impression is that nothing of importance will be done, but, so long as there is a possibility of change, buyers, after waiting so long, think they may as well see the thing through. This being the case, there is little to be said in regard to the market, inasmuch as it has been entirely of a hand-to-mouth character. Predictions as regards the future would be risky under present conditions, but it may be stated as a matter of fact that the trade are almost unanimous in their anticipations of a very active demand within the next two weeks. Stocks in consumers' hands have been reduced to an unusually low point, and as the demand for manufactured articles is likely to be heavy, there seems to be substantial grounds for expecting a sharp demand for the raw material. Supplies are abundant, undoubtedly, and it is hardly likely that prices will show much improvement, but a steadier market is confidently looked for, and possibly a slight reaction from the recent extremely low quotations. Sales during the week have shown a wide range of prices, some realizing as much as $24.50 at furnace for No. 1 Foundry, others shading $23 ; Gray Forge at $21, others at $18 @ $18.50. Under these circumstances it is difficult to quote with exactness, as price depends to a great extent on quantity taken, terms of payment and character of brand. For Lehigh brands the usual quotations are from $23 to $24 at furnace for No. 1 Foundry ; $21 @ $21.50 for No. 2, and $19 @ $20 for Gray Forge, with sales at both higher and lower quotations, according to circumstances.

Foreign Iron.—A sale of 800 tons Redcar No. 3 was made at $18 in store.

Bessemer Pig.—There are no sales to report, buyers still holding off. Quotations are $22 @ $22.50, according to shipment.

Spiegeleisen.—There is some inquiry, but prices appear to be a little firmer, say $32.50 @ $33 for 20 %.

Muck Bars.—Demand fair at unchanged prices, say $36.50 @ $37. One or two sales of good-sized lots were made at slightly lower figures.

Blooms.—Market quiet and prices rather easier. Sales at the following quotations, viz. : Charcoal Blooms, $63 @ $65 ; Run-out Anthracite, $55 @ $57 ; Scrap Blooms, $48 @ $50 ; Northern Ore Blooms, $45 @ $47.50.

Bar Iron.—The week past has been much of the same character as several preceding. Orders for large lots are few and far between, so that a good many mills are running not more than half or two-thirds of their capacity. There has been a pretty steady demand for small lots to "sort up," but the general position shows no improvement, either as regards price or demand. There can be no doubt that consumption has fallen off considerably within the past three months, but the depression cannot be altogether attributed to that. Tariff tinkering has had a bad effect upon business. Orders have been restricted within the narrowest limits possible, so that things have been made to appear worse than they really are. With the tariff definitely settled and the opening of the spring trade, there is every reason to hope for a satisfactory business, and for a few weeks, at all events, there may be some activity. Later on in the season business will probably be influenced more or less by crop prospects, both here and abroad, but, as regards the immediate future, the feeling is decidedly hopeful. Business has been done at about 2.25¢ @ 2.3¢ for the best Refined Iron, probably at a shade less in some instances, but in anticipation of a better market there is a general disposition to maintain prices firmly. Common Iron has been sold to a limited extent at 2¢, and Skelp Iron at 2.25¢ @ 2.3¢.

Plate and Tank Iron.—The week's business shows some improvement, both in price and demand, and the feeling is unquestionably somewhat firmer. Several good-sized orders have been placed, and with further inquiry for lots of 50 to 200 or 300 tons each, manufacturers begin to see their way to an active spring trade. The demand seems to be from all classes of trade, but for tank, bridge and boat building more particularly. Some of these are likely to be for large amounts, while sales of Boiler Iron during the week have been quite important. Prices may be quoted as before, viz. : 2.5¢ @ 2.6¢ for Boat and Tank Iron, 3.5¢ for Shell, 4.5¢ for Flange, and 5.5¢ for Fire-Box, with concessions on orders for large lots.

Structural Iron.—Some new business has been closed during the week, probably 800 to 1000 tons all told, with prospects of heavy orders toward the middle of the month. The mills are running very short of work, however, and competition for new business is very close. Prices are about as last quoted, say : 2.5¢ for Angles, 3.3¢ for Tees, 3.5¢ for Beams, and 3.7 for Channels.

Sheet Iron.—The market is very quiet and prices a little unsettled. Buyers of large lots do not appear to have made up their minds as to prices, so that, while there is some inquiry for summer delivery, actual sales have not been of much importance. Prices are unchanged, however, and for small lots may be quoted, viz. :

Common Sheets, No. 28	4½¢
Common Sheets, Nos. 26 and 27	4¼¢
Common Sheets, No. 22 to 25	4 ¢
Common Sheets, No. 16 to 21	3¾¢
Best Refined ¼ % advance on the above.	
Best Bloom Sheets, No. 26 to 28	7 ¢
Best Bloom Sheets, No. 22 to 25	6¾¢
Best Bloom Sheets, No. 16 to 21	6½¢
Common Red Plates, 3-16 to 16	3.1¢
Blue Annealed, 3 16 to 16	3.3¢
Best Bloom, Galvanized, discount	35 %
Second quality, discount	45 %

Boiler Tubes—Are very weak at 55 % discount from list price. Steam and Gas Pipe, 67½ % @ 70 %, but in some cases extra discounts have been allowed on large lots.

Steel Rails.—The market shows no change whatever ; prices still quoted $39 @ $40 at mill. No large lots have been called for, but orders for 500 to 1000, and in one case 2500 tons, have been placed, amounting in the aggregate to a very fair week's work. Buyers are evidently wating for a settlement of the tariff question, although in any event it is not likely that prices will show much change. A more active demand is looked for, however, and possibly a little more steadiness in values.

Railway Fastenings.—Spikes are steady at 2.8¢ ; Fish Plates and Splice Bars, 2.3¢ @ 2.4¢.

Crop Ends.—Latest sales were on the basis of $21.50, but according to cable advices prices are higher. There are buyers at $21.50, but sellers hesitate about naming $22 in the present unsettled condition of the market.

Old Rails.—Small lots of T's sell at $25.50 @ $26, but demand is very limited. Double Heads nominal at $27.50.

Scrap Iron.—Cargo lots, $26 @ $26.50 ; a 300-ton lot sold yesterday at the latter quotation. Selected lots from yard sell at $27.50 @ $28.

Nails.—Market weak and irregular, at $3.25 @ $3.30, with very sharp competition on large orders.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., Feb. 27, 1883.

While it must be admitted that there has been no improvement in the general Iron situation during the past week, the feeling obtains that, as there is no probability of any change being made in the tariff at present, there will soon be an improvement. In view of the recent failures, some nervous people are apprehensive that these will soon be followed by others, and that further on there is to be a panic similar to that of 1873-74. There is no ground for any such apprehension, as the Iron trade of the West never was in a more solid condition than at present. It is true that many of our mill and furnace owners have been spending a good deal of money in increasing their capacity and making improvements, but they are able to pay promptly anything they owe. Production has been largely curtailed since the 1st of January, furnaces have blown out, mills have changed from double to single turn, and at present there is reason to believe that the accumulation is light, both as regards the raw article and the products.

Ore.—The Ore situation remains unchanged. The Ore companies, like the furnacemen, are still anxious, and while they are hopeful of an early improvement, the outlook at present is not very encouraging ; the blowing-out of so many Pig Iron furnaces is very discouraging to the Ore men. It is very evident that the consumption not only of Lake, but all kinds of Ore, both domestic and foreign, will be considerably less this year than last, as a good many of the furnaces now out will not be started up again for some time. Some are undergoing repairs, others have considerable Pig Iron not disposed of, and aside from all this, there is a determination on the part of furnacemen to have cheaper Ore, claiming that Ore has been bringing more money, relatively, for several years past than Pig Iron.

Pig Iron.—The dullness noted for several weeks past continues ; there was less business last week than during any preceding week this year, the sales reported aggregating less than 500 tons. Prices continue weak, and we hear of some pretty low figures quoted by buyers, but, so far as we can learn, there have been no sales of standard brands below the prices quoted a week ago ; makers of the latter aver that prices are down to bed-rock, and refuse to make any further concessions. We are reliably informed that an Eastern furnace selling a good deal of Iron in this market is refusing to duplicate orders at prices obtained a few weeks ago. We continue to quote No. 1 Foundry at $22.50 @ $23, 4 months ; No. 2 do., $21 @ $21.50 ; No. 3 do., $19 @ $20 ; Neutral Forge, $19.50 @ $20.50, 4 months. Cold-blast Charcoal Iron ranges all the way from $30 to $37, according to quality and brand ; Bessemer Iron continues quiet, but prices remain unchanged. So far as we know, there have been no sales made below $22.50, 4 months, and the general belief appears to be that it has touched bottom.

Muck Bar.—There is considerable offering, and there would be a good deal more if there was any chance to dispose of it, but brokers report that there is no demand, and, in the absence of sales, we repeat former quotations—$35, cash, at mill, at which, it is said, a good quality of Neutral can be obtained. Some of the small country mills would rather sell their Muck Bar than work it up into Finished Iron.

Manufactured Iron.—While some manufacturers report an increased inquiry, business continues dull and very unsatisfactory, especially in regard to prices, which, under the influence of a sharp competition, have been reduced to such an extent that it is difficult to obtain a new dollar for an old one. It is probable, however, that as soon as the tariff bugbear has been taken out of the way, there will be an increased demand, as stocks are very much reduced in the hands of jobbers and large consumers, and when they can satisfy themselves that there is to be no further decline in prices, they will at once commence to order. We continue to quote on a basis of 2¢ for Bars, 60 days, 2 % off for cash, although a very desirable order might be placed at 1.90¢.

Nails.—Trade continues light, and, according to agreement, there will in a few days be another general shut-down for a couple of weeks, by which time it is hoped that the spring trade will have opened up. One reason for the light business at present is that large buyers have an idea that the price cannot be maintained in view of the low price of Finished Iron, and they are buying very lightly in consequence. We repeat former quotations—$3.40, 60 days, 2 % off for cash, with the usual abatement of 10¢ ℔ keg on carload lots and upward. The next regular meeting of the Western Nail Association will take place on the second Wednesday of March.

Wrought Iron Pipe.—There has been no change in the general position of the market since our last report. There is no scarcity of orders, but prices are very unsatisfactory, and manufacturers generally are refusing to contract ahead at present rates. Discounts on Gas and Steam Pipe remain unchanged at 70 @ 70 and 5 % : on Boiler Tubes, 55 % off ; Oil-well Casing is quoted at 50¢ @ 60¢ ℔ foot, net ; do. Tubing, 15¢ @ 17¢, net.

Steel.—Forty dollars, cash, at mill, is still regarded as the ruling price here, although the Cambria Co.'s last quotation was $41, delivered in Pittsburg. The Edgar Thomson, Pittsburgh Bessemer and Cambria works are pretty well sold ahead, and the Western market is firmer in consequence, although no immediate advance is expected.

Steel.—The general Merchant Steel trade continues dull. But few, if any, of the mills are fully employed, although one concern reports having obtained orders from the East for some 500 tons of Steel Ship Plates—something new here.

Old Rails—Continue very dull in this market ; there has not been a single sale reported for several weeks, which is owing to the fact that consumers are pretty well stocked. We continue to quote American Tees at $26 @ $26.50 on spot—might be obtained for future delivery at $25, and were offered here at that price a few weeks ago. There have been no Double Heads sold here since early in the winter. Consumers are unwilling to buy at the price they are held.

Crop Ends.—There have been no transactions reported for several weeks, in the absence of which we continue to quote at $25 ℔ gross ton. The arrivals have been liberal of late, but these are all being placed on previous contracts.

Railway Track Supplies.—Railway Spikes have been reduced to 2¾¢, 30 days. Splice Bars have declined to 2.20¢ @ 2.25¢ ; Track Bolts, 3½¢ with Square and 3.60¢ @ 3.65¢ with Hexagon Nuts.

Scrap.—Wrought Scrap is still quoted nominally at $25 @ $26 ℔ net ton for Ordinary, and $27 for Selected Railroad ; Wrought Turnings, $18 @ $19 net ton ; Old Car Wheels, very dull, $23 @ $23.50, gross ton ; Cast Borings, $14 @ $14 50, gross.

Coke.—Prices are weak ; operators continue to quote at $1.15 ℔ ton, free on cars at ovens, but it is rumored that sales in some instances have been made as low as $1.

CHICAGO.

Office of *The Iron Age*, 36 and 38 Clarke St., cor Lake, CHICAGO, Feb. 26, 1883.

Hardware.—Trade in Shelf and Heavy Hardware continues fair, without any changes of note in quotations. C. W. Kimball & Co. quote the following prices for their "Holly" and "Peerless" Hose Carts :

	Holly.	Peerless.
No. 1	$5.00	$3.00
No. 2	6.00	4 00

No. 1 carries 75 to 100 feet of ¾-inch hose. No. 2 carries 100 to 200 feet of ¾-inch hose. Discounts 35 %.

They claim that the "Holly" is superior to all others, in that the "drum" is of slats or ribs, and the hose wound upon it can dry more thoroughly than upon others which are of sheet iron or inclosed. It has an adjustable ratchet appliance to prevent unwinding ; also clamps for the nozzle and coupling. The "Peerless" is cheap, though very strong and neatly built. The reel consists of a pulley upon which the hose is wound, thus keeping it in a circular coil and preventing the bends and breaks which render the best hose useless before it is half worn out.

Nails.—The demand for 10d. to 60d. Nails has increased somewhat during the past week, and are quoted firm at $3.50 ℔ keg, with 2 % off for cash.

Manufactured Iron.—Quotations remain unchanged, with a good, fair demand existing. We quote : Bar Iron, 2.30¢ @ 2.40¢ rates ; Angle Iron, 3.10¢ @ 3.30¢ rates ; T Iron, 4¢ rates ; Beams, 3.80¢ ; Channels, 3¢ ; Tank Iron, 3¢ @ 3.20¢ rates ; Sheet Iron, 3.20¢ @ 3.40¢ rates ; Norway Original Bars, 4½¢ rates ; Norway Re-rolled Bars, 5¼¢ rates ; Ulster, 4½¢ rates ; Low Moor Iron, 8¢ rates ; Nuts and Washers, 8¢ off list ; Wrought Boat Spikes, 3¼¢ rates.

Pig Iron.—The inquiry for Charcoal Pig Iron continues to be about as previously reported, consumers, as a rule, buying for their immediate wants only in lots of 100 tons or so, while an occasional sale of 1000 tons is reported at regular quotations, which are considered very low. We quote Nos. 1 and 2, $24 ; No. 3, $25, and Nos. 4, 5 and 6, $26.50, 4 months ; Briar Hill, $25 ; Silvery Soft, $23 @ $24 ; Crane No. 1, $27.50 ; No. 2, $26.50 ; Himrod, $24.50 ; Thomas, $27.50 @ $28 ; American Scotch, $24.50 @ $25 ; Du Val, No. 1, $24 ; No. 2, $23 ; Fulton Notch, No. 2, $22.50 ; No. 3, $21.50. Imported Scotch is held at $31 ℔ ton, cash, and is scarce, with a moderate demand. Southern Coke is held very firm at $24.50, and in good request. Calumet, $23 @ 23.50, 4 months.

Steel.—Tool Machinery and Agricultural Steels have undergone no change since our last writing, the demand continuing good and quotations firm. We quote as follows : Tool, 12¢ ; Machinery O. H., 5¢ ; Crucible Machinery, 7¢ ; Hammer, 2 inches and under, 8¢ ; over 2 inches, 9¢ ; Cast Spring, 6¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢ ; Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢ respectively ; Crucible Plow, 6¢ ; Eagle Plow, 5¢ ; Iron Center Plow, 9¾¢, and Soft Steel Center Plow, 9¾¢ ; Cast Plow, 5¢ ; German Plow, 4½¢.

Scrap Iron.—Market is dull and weak. The following are the purchasing prices paid by dealers : No. 1 Railroad Wrought Scrap, ℔ net ton, $22 ; No. 1 Country Wrought Scrap, ℔ net ton, $21 ; No. 1 Cast Scrap, ℔ ton, $17 ; No. 1 Stove Plate Scrap, ℔ ton, $12 ; Machine Shop Wrought Turnings, ℔ ton, $10 ; Cast Iron Borings, $7.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts. CHATTANOOGA, Feb. 26, 1883.

The week has been another unfavorable one for outdoor movements, and operations are restricted to necessities. General trade is fair and business men are generally cheerful. The grain and lumber trades are especially in good condition. Streams are full and the boating trade good.

Pig Iron.—Production holds up strongly. Foundry continues rather scarce on account of unfavorable weather for its production. Contracting will be active after Congress adjourns and the market for lower grades will strengthen. Wheel Irons are nominal, though there is some expectation that demand will arise for the small stocks to be found in this district early in the spring. We quote : No. 1 Foundry, $22 @ $23 ; No. 2 Foundry, $20 @ $21 ; Gray Forge, $18 @ $19 ; White and Mottled, $18 @ $20 ; Car-wheel Metal, $31 @ $35.

Ores.—We quote : 50 % Brown Hematite, ℔ ton, $2 @ $2.75 ; Red Fossil, $2 @ $2.25, delivered at furnace.

Miscellaneous Articles—Old Rails are unsought and held at $25. Concessions would be necessary to sell any amount of them. Scraps are a drug ; Wrought, $18 @ $22 ; Cast Scrap, $11 @ $14 ; Old Wheels, $24.

Nails.—We quote at $3.40 strong for large lots at mills, 60 days ; 15¢ higher for small bills.

Manufactured Iron.—Southern Bar mills are on double turn and report fair business. We quote at $2.40 and steady for large bills ; Railroad Spikes, $3.20 ; Track Bolts, $3.75 ; Fish Plate, $2.50.

Coal.—We quote : Fancy Lump, $4 ; Common, $3 @ $3.50 ; run of mine to manufacturers, $2.

Coke.—We quote : Furnace Coke, $3 at point of consumption ; Foundry, 10¢ @ 12¢ ℔ bushel.

Steel and Iron Rails.—There is no market. Southern roads are having their worn-out Iron rerolled for replacement—a sort of makeshift policy. Small lots of Steel Bars are occasionally placed by our brokers for Pennsylvania mills.

CINCINNATI

FEBRUARY 26, 1883.—*Pig Iron.*—The late floods in the Ohio have so far subsided as to enable a general resumption of business in the foundries, machine shops and rolling mills during this week. Since the subsidence of the waters in this immediate vicinity it is found that the absolute losses of property by the flood, although very great, have been largely overestimated. From a sanitary point of view it is thought the late flood will finally prove to be a benefit rather than an injury along the river and within the limits of Cincinnati, Newport and Covington, as all the cellars, back alleys, sewers, vaults, &c., are being thoroughly cleaned and ventilated, a treatment that many of them have not had in a quarter of a century. Many of the fac-

tories and storehouses that have lately been flooded are being overhauled. Defects in foundations and the woodwork, from age, are discovered only in time to save great damage to machinery and other property. During the past week there has been a fair trade in all kinds of iron, orders being confined to small lots for immediate uses, quotations covering them as follows: No. 1 Hanging Rock Charcoal Foundry, $25 @ $26; No. 1 Hanging Rock Coke Foundry, $23; No. 1 Southern Coke Foundry, $21.50 @ $22; No. 2 of above, from 50¢ to $1 less; Silver Gray Softeners, No. 1, $22; No. 2, $21; No. 3, $20; Silver Gray Softener and Fluxer, $22.50; Forge Irons, $19.50 @ $24, covering Stonecoal, Coke and Charcoal kinds; Car Wheel Irons, Cold-blast Charcoal, $30 @ $31; Warm-blast, $26 @ $28; Blooms, Best Charcoal Hammered Flanging, $50; Pig and Common Scrap, $35 @ $40; Scrap Iron—Old Rails, T's and D. H., $25 @ $26.50; No. 1 Wrought, $1.20 @ $1.40; Country, $1 @ $1.20; Light, 90¢ @ $1; Cast, Heavy, No. 1, 80¢ @ 85¢; Light, 50¢ @ 75¢.

LOUISVILLE.

MESSRS. GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of February 24, 1883: The Iron business has been almost entirely suspended during the last week by the flood. Many of the largest concerns are more or less under water. It is likely that it will be from two to six weeks before these concerns are under way again. We continue our last week's quotations, with some slight changes. These quotations represent cash prices for round lots:

FOUNDRY IRON.

No. 1 Hanging Rock Charcoal	$25.50 @ 26.00
No. 1 Southern Charcoal	22.00 @ 23.00
No. 1 Hanging Rock Stonecoal and Coke	22.00 @ 22.50
No. 1 Southern Stonecoal and Coke	22.00 @ 22.50
No. 2 Southern Stonecoal and Coke	21.00 @ 21.50
"American-Scotch"	21.00 @ 22.00
Open Silver-gray	20.00 @ 20.50
Close Silver-gray	19.00 @ 19.50

MILL IRONS.

No. 1 Charcoal	21.00 @ 21.50
No. 1 Stonecoal and Coke, Neutral	19.50 @ 20.40
No. 2 Stonecoal and Coke, Neutral	19.00 @ 19.50
No. 1 Stonecoal and Coke, Cold-short	18.50 @ 19.00
No. 2 Stonecoal and Coke, Cold-short	18.00 @ 18.50
White and Mottled, Cold-short and Neutral	17.00 @ 18.00

CAR-WHEEL IRONS.

Hanging Rock, Coal-blast	30.00 @ 32.00
Hanging Rock, Warm-blast	25.00 @ 27.00
Alabama and Georgia, Warm and Cold-blast	26.00 @ 28.00
Central Kentucky, Cold-blact	26.00 @ 28.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 115 to 121 West Main street, report to us as follows, under date of Feb. 24, 1883: Business for the past week has been fair, with few new features to note. The drowned-out factories have emerged from the muddy flood and the men have gone to work. The liberality of the American people was never more happily evinced. Unsolicited contributions came from North and South, and even the little country towns sent in their quota with a message of sympathy. As your correspondent was chairman of the Relief Committee, he was in a good position to judge of the generous spirit in which such aid was offered. When want or distress shows itself, neither politics nor sectionalism interferes to prevent relief. Iron is quoted the same, and can be bought as low as at any previous date since the decline set in, despite the fact that some mills threaten an advance. An improvement is not impossible after the adjournment of Congress. The sessions of our legislative bodies, State and national, are dreaded, as causing doubt and distrust to prevail. Last week's quotations hold good—Bar Iron, $2.25 @ $2.30. Nails are moving in small quantities only. From store we quote $3.50. There is promise of abundant supply. *Rivets.*—We note a decline in Burden Boiler Rivets, incident to their recent circular. Tank Rivets, much demoralized of late, are advanced by the manufacturers to 40 and 7½. General orders for Hardware are as good as one could expect in view of the weather.

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Feb. 26, 1883: Trade for the past week has ruled quiet and depressed. Values are drooping and daily shaded to induce orders, which are only placed to meet immediate wants.

Ref. Bar Iron, 1 to 6 x ¾ to 1	₩ lb	2 4-10 @ 2 5-10¢
" " 1 to 4½ x 1½ to 1	₩ lb	2 4-10 @ 2 5-10¢
" " ½ to 2, Round and Square	₩ lb	2 4-10 @ 2 5-10¢
Hoop Iron, 1½ wide and upward	"	3 2-10 @ 3 3-10¢
Band Iron, from 1½ to 6 in. wide	"	2 9-10 @ 3 ¢
Horse-shoe Iron	"	3½ @ 3¾¢
Norway Rail Rods	"	5¼ @ 5½¢
Black Diamond Cast Steel	"	11 @ 12 ¢
Machinery Steel	"	4½ @ 5 ¢
Spring Steel	"	4 @ 4¼¢
Common Horse Nails	"	10 @ 11 ¢
Railroad Spikes, 5½ x 9-16	"	3 @ 3¾¢
Perkins' Horse shoes, ₩ keg of 100 lb		$4.87½
" Mule shoes		5 87½

MESSRS. R. C. HOFFMAN & Co., Pig and Railroad Iron Merchants, 21 South Frederick street, report to us as follows, under date of Feb. 26, 1883: The Iron market remains dull and quiet. There is no material change in prices, and purchases are made for immediate use only. We quote as follows:

Baltimore Charcoal Wheel Iron (all Baltimore Ore)	$28.00 @ 30.00
Virginia C. B. Char. Wheel Iron	28.00 @ 30.00
Anthracite No. 1	23.00 @ 25.00
" No. 2	21.00 @ 23.00
" No. 3	20.00 @ 21.00
" White and Mottled	18.00 @ 19.00
Charcoal C. B. Blooms	55.00 @ 57.00
Refined Blooms	45.00 @ 47.00

ST. LOUIS.

MESSRS. HOFFER & Co., Pig Iron and Iron Ore Merchants, 417 Pine street, report to us as follows, under date of Feb. 24, 1883: The market remains unchanged. Quotations are:

HOT BLAST CHARCOAL IRONS.

Missouri	$21.00 @ 22.00
Southern	22.00 @ 24.00
Ohio	27.00 @ 29.00

COAL AND COKE IRONS.

Missouri	21.00 @ 22.00
Southern	20.00 @ 22.00
Ohio	21.00 @ 26.00

MILL IRONS.

Red Short	19.00 @ 21.00
Neutral	18.00 @ 20.00

CAR WHEEL AND MALLEABLE IRONS.

Missouri	24.00 @ 25.00
Southern	25.00 @ 30.00
Ohio	25.00 @ 35.00

RICHMOND.

MR. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows, under date of Feb. 26, 1883: Considerable sales continue to be effected on the basis of last quotations. The market is quiet and nominally unchanged:

No. 1 Scotch Pig Iron	26.00 @ 28.50
No. 1 Anthracite Pig Iron	25.00 @ 27.00
No. 2 " "	23.00 @ 25.00
No. 1 Virginia Coke Pig Iron	22 50 @ 24.00
No. 2 " "	21.00 @ 22.50
No. 3 " "	20.00 @ 22.00
White and Mottled	18.00 @ 21.00
Virginia C. B. Charcoal	27.00 @ 29 00
Old Dom. Nails (carload lots)	3.40 @ .....
Old Rails	25.00 @ 26.00
Old Wheels	19.00 @ 22.00
Wrought Scrap, No. 1	22.00 @ 24.00
Cast. Scrap, No. 1	19.00 @ 20.00
Richmond Refined Bar Iron	2.4-10¢ base
Horse Shoes (Tredegar)	4.50 @ .....
Mule "	5.50 @ .....

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From Our Regular Correspondent.)

LONDON, ENG., Feb. 13, 1883.

THE WEEK

has not been noticeably different from several of its immediate predecessors, yet I should not be greatly surprised were we to date something in the nature of an improvement from about this period of the year. It is my business to note the course of events in iron and metals on your behalf, and as I have been intimately associated with those trades for a series of years, I have a certain amount of experience on which to rely in given emergencies. Applying what I know and what I have learned by experience, I am almost tempted to conclude that the past few days have been characterized by an advance in point of the business actually done. At the same time the change is so slight that I hesitate to give it a warranty, preferring rather to test it for another week or so before endeavoring to formally announce its existence. As it is, I can scarcely account for the tentative alteration. Certainly the prospects of the home markets are all adverse, the heavy rains and floods of the week having come after a winter which has in most parts of Great Britain been singularly wet. For the British agriculturist the outlook is anything but bright, the saddened state of the soil having either rotted the seed sown last autumn or made plowing wholly impracticable. Some of the foreign and Colonial markets present a better appearance, including your own, and it is probably in this respect that we have the real foundation for what is happening. Statistically we are little better, for, as I showed last week, the shipments in Cleveland decreased during January and left an increase of 26,000 tons for the month. Since I last wrote the official returns of the Board of Trade have been issued (as detailed elsewhere) and show a decreased export business in iron and steel, although both the imports and exports increased. These figures may have consoled those who had expected a greater falling off, but, as a whole, I do not think they have proved encouraging. In all probability, therefore, we owe what is going on at the moment to the placing of orders by merchants who had been withholding their favors until they believed bottom figures had been reached, and who have given them out on the supposition that they could gain nothing by further delay. At all events, it is a fact that large orders for Welsh bars have been placed for India, pig for the Continent, plates for home shipbuilding, and steel rails for Australia, &c. These new contracts fully bear out my remarks of last week as to low prices creating business which might not otherwise come into existence at all.

As to the reduction in marked bars, mentioned in my last report, there has been a good deal of somewhat acrimonious comment and criticism. In several well-informed quarters the change is held to have been entirely unnecessary and unwarrantable, on the ground that 10/ difference in the price of that grade of iron does not affect the demand to any appreciable extent, while concurrently it creates a general feeling of dissatisfaction and causes consumers of other classes of merchant iron to "worry" the makers for a reduction which cannot be made. In this contention there is no doubt a certain amount of truth, but I fail to see, personally, why the list houses should give themselves any anxiety on behalf of the makers of unbranded or medium iron. As a matter of fact, I don't believe such is the case—indeed, I fancy the only parties who really dislike the change in marked bars are those who make a grade of iron which always profits by a wide margin between it and the "marked" iron. With the latter at £8 and the former at £7, the unmarked iron was pretty sure of the preference, but with only a 10/ margin, the case is not quite on all fours. If to this be added a little irregularity among the list houses, there appears to be abundant reason for the dissatisfaction of the ordinary manufacturers. If the makers of the common iron could also drop their prices 10/ or so ₩ ton, a fresh departure would be initiated, but they declare their total inability to do so—hence these tears! The Welsh people seem to "paddle their own canoe" quite contentedly, and while the inland manufacturers are quarrelling and cutting each others' throats (metaphorically only!), the Welshmen are busily engaged and reported to be sold ahead for some three or four months.

THE IRON MARKETS

are almost unaltered—as regards quotations, at all events. Consumers and merchants are still pressing for lower offers, but the smelters and other producers are gallantly on the defensive, and, as a rule, intimate that they have spoken their last word on the subject of concessions. They also assert that they will make a sharp reduction in the output rather than put down rates to a lower level than that now obtaining. At Glasgow warrants have remained quite inanimate at 47/6 @ 47/10 ₩ ton, with fluctuations of such limited proportions that holders must wish for a speedy rise in order to clear the 1d. ₩ ton per month charged for storage. I see your contemporary, *Iron*, declares that the death-knell of warrants has been sounded. The declaration is, I think, a trifle premature, but I am quite at one with the writer in deeming the best days of the Glasgow "ring" gone by. That the system worked well in the past is amply shown by the enormous fortunes realized by many of the Scotch ironmasters and brokers, but the conditions of to-day are different, and in any ordinary state of trade the influence of Glasgow warrants must be very moderate. Should we ever have another "boom" the speculators might have another innings, but even then they could scarcely hope to repeat the big strokes of 1872 and certain other earlier junctures. At present the "leading feature" of Glasgow is the possession of the most unwieldly stock of pig iron in the whole world, and, as things are just now, the distinction is about equivalent to the ownership of a white elephant. It is somewhat curious that Connel's stocks are steadily decreasing week after week. Close observers say they can perceive nothing in the general state of the Scotch malleable iron trade to account for the diminution, while the published returns as to shipments are similiarly insufficient to account for the decrease. That being so, it is hinted that the quantity of iron withheld from the stores is accumulating in makers' own yards, in order to serve the triple purposes of improving the statistical position, upholding the prices of warrants and maintaining the difference between G.M.B. and named brands. At all events, special brands of Scotch pig do continue very dear, compared with warrants, whatever the reason may be. I hear of additional shipments from Glasgow and Ardrossan to your ports, favored by low rates of freight, and I think it not untimely to state that should any tariff legislation be effected this session you may expect certain speculative consignments without delay.

In the North of England pig iron has not recovered from the rather bad break of last week, the nominal quotation for No. 3 being 4/6 ₩ ton, with actual sales at 3d. ₩ ton below that limit. On the West Coast there are not many new sales, and the smelters ask late rates, while parcels from second hand are obtainable as low as heretofore. Some American inquiries are reported for mixed lots, in usual proportions, for next three months, but I have not heard of other than limited transactions. There is a respectable call for spiegeleisen and ferromanganese, the latter chiefly from South Wales. Merchant iron is unaltered, but the low prices are fostering business, and it is reported several good commissions have been given out since my last report. Prices are as cabled at date, the marked bars of the Staffordshire list houses remaining at £7. 10/; medium bars, £6. 15/ @ £7; common, £5. 17/6 @ £6. 10/, and ordinary Welsh, £5. 12/6 @ £5. 15/. The last named are selling well for India, and are also inquired about for your Southern ports, Italy, &c. Hoops for baling purposes are asked after by your buyers, and a few lots have been sold at about £7, f.o.b. Liverpool, whence the freight to Baltimore has been arranged at 12/6 ₩ ton. Sheets are moderately steady at £7. 15/ @ £8 for ordinary singles. Small lots of iron rails have been sold at £5 @ £5. 10/, but are mostly 14-pound sections and other very light sorts. There is scarcely any inquiry for old rails for export, but some of the railway companies have disposed of considerable quantities to home consumers for rerolling purposes at better prices than those offered from your side. Heavy wrought scrap is nominal at 57/6 @ 60/, f.o.b. London, whence reasonable United States freights for such material are not on offer. A fair inquiry has sprung up for Bessemer 7 by 7 inch blooms, but makers have either declined to quote, or have put forward fancy prices in evidence of their preference for rolling the blooms into rails, &c., themselves. Crop ends are neglected at 60/, f.o.b. Wales, &c., and old railway leaf-spring steel is dull at recent figures. Steel rails are quite nominal, but decidedly tending in an upward direction.

A BIG RAIL ORDER

has been given out within the past few days, in such a quiet way, too, that only one of the trade papers here has made any illusion to it. It is a contract given out by the Government of New South Wales for 72,695 tons of steel rails (including the necessary quantity of fish plates) of 71½ lb ₩ yard weight, with deliveries extending over the next four and a half years. I am not at liberty to state who are the recipients of this large order, but when I say it has found its way to Sheffield, you may "guess at twice." The price agreed upon, I understand, is £5 ₩ ton all round, which quotation I assume is f.o.b., or equal to something like £4. 10/ or £4. 12/6 at the works. While discussing rail prices the other day with a manufacturer, I rather pointedly asked him if he had taken any orders recently at £4. 5/ or £4. 7/6 ₩ ton. He promptly denied the soft impeachment, and expressed a doubt whether such low figures had been reached in any quarter of late. He thought £4. 12/6 or £4. 15/ might have been taken for parcels of over 70 lb ₩ yard. He also reported most of the larger concerns full of work—for the present. The American order for steel rails, mentioned by me last week, has either been placed within the past few days, or is on the point of being arranged. As the Belgian mills are very full, it is believed the rails must be rolled in this country.

SCOTCH PIG IRON

remains dull and inanimate at about late rates. Shipments last week showed a large comparative decrease, bringing down the total increase to date to 4395 tons. Stocks in Connal's stores continue to decrease, the diminution last week being 2857 tons, making the total now held 597,859 tons, against 631,155 tons this date, 1882. There are 110 furnaces at work in Scotland, against 106 a year ago. Writing from Glasgow on Feb. 10, James Watson & Co. said: "In the early part of this week the Scotch iron market was depressed, owing to an absence of speculative buying and a quieter demand for makers' iron. During the past few days the price has, however, rallied somewhat. The warrant market opened on Monday last at 47/7, touched 47/8 and afterward receded to 47/6 cash. On Tuesday the price declined from 47/6½ @ 47/2½, while on Wednesday the market was irregular, as low as 46/11½ being accepted in the forenoon and 47/4½ being paid in the afternoon. Yesterday the price fluctuated between 47/3½, 47/5½ and 47/3, and to day the market advanced to 47/6, closing with sellers at that figure. The shipments last week were 8874 tons, as compared with 12,361 tons for the corresponding week of last year." We quote:

	No. 1.	No. 3.
G. M. B., at Glasgow	49/	47/
Clyde, "	52/6	50/6
Coltness, "	63/6	55/
Langloan, "	65/6	55/6
Garsherrie "	62/6	53/6
Summeriee, "	62/	52/
Calder, "	62/6	52/
Carnbroe, "	56/	50/
Glengarnock, at Ardrossan	56/	50/
Eglinton, "	50/	48/
Dalmellington, "	50/6	49/6
Shotts, at Leith	65/6	56/
Kinneil, at Bo'ness	49/	48/
Carron, at Grangemouth	50/9	....

MIDDLESBORO' PIG IRON

is dull and slow of sale at the following rates for G.M.B., f.o.b. at makers' wharves in the Tees, for net cash, less 2½ % on 10th of following month:

No. 1 Foundry	43/6	Mottled	40/3
" 2 "	43/6	White	39/9
" 3 "	41/6	Refined metal	57/
" 4 "	41/	Kentledge	42/
" 4 Forge	40/9	Cinder	35/

WEST COAST HEMATITES

are not materially changed, mixed lots being obtainable at 51/ and upward, makers' being steady at 52/6 @ 54/ ₩ ton, and named brands are:

	No. 1.	No. 2.	No. 3.
Cleator	58/6	58/	57/6
Lonsdale	54/	53/	52/6
Workington	54/	53/	52/6
West Cumberland	....	....	....
Lowther	54/	53/	52/6
Moss Bay	....	....	....
Distington	54/	53/	52/6
Harrington	54/	53/	52/6
Solway	54/	53/	52/6
Maryport	54/	53/	52/6

There are 59 furnaces at work of 82 built. Last week's shipments included 7864 tons pig iron and 3161 tons of rails.

THE BOARD OF TRADE RETURNS

for the month of January show that our exports were worth a total of £20,608,659, compared with £19,820,683 in January, 1882, while the imports were valued at £35,736,846, compared with £32,019,467. The total quantity of iron and steel exported was 289,802 tons, worth £2,406,031, against 317,390 tons, valued at £2,464,147, in the same month of last year. The decrease was chiefly in pig iron, scrap iron, tin plates and unwrought steel, and largely owing to the diminished requirements of your market. In railroad iron, hardware and cutlery, steam engines and other machinery there was a satisfactory expansion. The leading articles of export are thus summarized:

January.	Quantities.		Values.	
	1882.	1883.	1882.	1883.
Firearms, No.	15,391	17,453	£73,433	£77,701
Copper, unwt., cwts.	16,567	28,963	60,234	102,022
Copper, wrt., cwts.	24,128	29,476	101,260	115,627
Mixed or yellow metal sheathing, cwts.	16,438	23,784	88,905	73,619
Coal, &c., tons	499,497	1,486,349	701,892	758,052
Hdw. and cutlery	....	....	340,980	341,982
Pig iron, tons	103,961	78,720	295,676	215,310
Bar, angle, bolt and rod	23,754	24,510	173,474	177,460
Iron rails, tons	11,104	3,245	64,543	22,859
Steel rails, tons	46,796	68,276	377,249	415,103
Railroad of all sorts, tons	78,940	89,063	533,141	602,479
Wire (except teleg. wire), galvanized or not, tons	7,937	7,127	110,809	102,567
Hoops, sheets, and boiler plates, tons	26,710	27,736	311,964	322,050
Tin plates, tons	23,154	20,340	415,103	364,036
Cast or wro't, tons	22,817	27,773	339,956	409,184
Old for manufacture, tons	12,180	7,454	46,247	27,779
Steel, unwr'ght, tons	17,531	4,328	175,635	117,009
Manf'actures of steel and iron, tons	1,412	1,745	70,202	68,107
Lead — Pig, rolled sheet, piping, and tubing, tons	2,846	3,076	44,906	46,673
Steam engines	....	....	267,056	362,245
Other descriptions of machinery and mill work	....	....	597,902	728,034
Plate and plated and gilt wares	....	....	23,323	21,613
Tel. wire & apparatus connected therewith	....	....	29,813	296,167
Tin (unwrt.), cwts.	5,683	9,902	31,718	49,173
Zinc or spelter, cwts.	14,937	6,231	11,944	5,093

TO THE UNITED STATES.

Articles.	Month of January, 1883.	Month of January, 1882.	Month of December, 1882.
Alkali, cwts.	341,924	266,913	314,058
Hardware and cutlery, £.	45,287	48,574	37,202
Iron—Pig, tons	21,220	31,460	29,560
Bar, angle, rod, &c., tons	1,316	2,639	1,850
Railroad, all, tons	6,606	27,523	7,222
Hoops, sheets, plates, &c., tons	1,315	3,733	1,209
Tin plates, tons	16,371	19,950	15,026
Cast or wrought, tons	772	598	447
Old, tons	5,345	9,215	10,813
Steel, unwrought, tons	2,357	15,430	4,751
Lead, all sorts, tons	45	226	81
Steam engines, £	5,854	1,830	6,884
Other machinery, &c, £	37,142	45,355	35,856
Tin, unwrought, cwts.	949	642	595
Special return—Iron rails, tons	131	8,763	8
Steel rails, tons	5,962	18,504	6,734

THE AVERAGE PRICES

paid per ton for certain leading articles last month I have worked out as under to the United States: Pig iron, £3. 3/1; scrap iron, £3. 12/0¼; unwrought steel, £21. 11/9½ (no blooms this time); iron rails, £5. 19/6½, and steel rails, £5. 12/11. General averages to all countries, including the United States: Pig iron, £2. 14/8¼; scrap iron, £3. 14/6¼; unwrought steel, £22. 3/2¼; iron rails, £7. 0/10¼, and steel rails, £6. 1/7 ₩ ton. The price of unwrought steel conclusively shows that blooms are not being sent to your market at present.

BRISTOL CHANNEL SHIPMENTS.

Messrs. Edwardes, Robertson & Co., Cardiff, advise me as under: "The shipments during the month of January, as will be seen on reference to the annexed figures, have declined to a very low total, with the exception of tin plates, which are up to the average quantity. Until we have something settled as to the proposed new tariff in the States, the returns of exports will no doubt be very limited. Freights remain nominal, both to the Northern and Southern ports. To New York by berth steamers the rates have averaged from 7/6 to 10/; Baltimore, one steamer, 8/6, and New Orleans, 11/6. For future shipments no immediate increase in freight is anticipated." The figures referred to are: New York, 114,817 boxes tin plates, 331 tons wire, 413 tons scrap iron, 900 ingots tin, 165 casks oxide iron and 219 casks sulphate zinc; Baltimore, 1022 tons crop ends; New Orleans, 1000 tons rails; Vera Cruz. 397 tons rails, 16 tons spikes and 14 tons fish plates.

SOME CURRENT PRICES.

IRON.

	Prices per ton. £ s. d.		£ s. d.
Bars, Welsh (in Wales), f.o.b.	5 12 6	@	0 0 0
Bars, Staffordshire (London), f.o.b.	7 2 6	@	8 17 6
Bars, North Country (in the Tees or Tyne), f.o.b.	5 17 6	@	0 0 0
Angle iron, North Country (in the Tees or Tyne), f.o.b.	6 0 0	@	0 0 0
T, North Country (in the Tees or Tyne) f.o b	6 10 0	@	0 0 0
Nail rods, best tough, (London), f.o.b.	6 17 6	@	0 0 0
*Hoops, ordinary, f.o.b.	7 5 0	@	0 0 0
*Hoops, good quality, f.o.b.	7 12 6	@	0 0 0
*Sheets, ordinary, f.o.b.	8 12 6	@	0 0 0
*Sheets, good quality, f.o.b.	9 5 0	@	10 0 0
*Plates Staffordshire, (Crown), f.o b	8 10 0	@	10 0 0
*Plates, best boiler and tank, f.o.b.	8 15 0	@	10 0 0
Swedish hammered bars, London, ex-ship	9 15 0	@	10 10 0

*5/ @ 7/6 less Liverpool.

GALVANIZED IRON.

Corrugated sheets, ordinary quality, 20 gauge, f.o.b.	12 15 0	@	0 0 0
Corrugated sheets, ordinary quality, 24 gauge, f.o.b.	13 15 0	@	0 0 0
Corrugated sheets, special brands, 24 gauge, f.o.b.	14 10 0	@	0 0 0

COPPER.

Sheet and sheathing, f.ob.	74 0 0	@	76 0 0
Flat bottoms, f.o.b.	78 0 0	@	0 0 0
Tough cake and ingot, f.o.b.	70 0 0	@	0 0 0
Flat tiles for India, about 14 lb, f.o.b.	70 0 0	@	0 0 0
Best selected ingot, f.ob.	71 10 0	@	72 0 0
Burra Burra, Wallaroo (in warehouse)	71 0 0	@	71 10 0
Chili slab in Liverpool for prod., 96 % (in warehouse)	65 15 0	@	0 0 0
Yellow metal sheathing, P. H. Muntz & Co.'s, f.o.b., ₩ lb	0 0 6½	@	0 0 0
Yellow metal brazier, P. H. Muntz & Co.'s (soft, specially made for India), f.o.b., ₩ lb	0 0 6⅝	@	0 0 0
Copper wire, 1 @ 20, del'd., ₩ lb	0 0 9½	@	0 0 0
Brass wire, 1 @ 20, del'd, ₩ lb	0 0 7¼	@	0 0 0

TIN.

English block or ingot, f.o.b., ₩ ton	98 0 0	@	0 0 0
English block, bars, f.o.b., ₩ ton	99 0 0	@	0 0 0
English refined block or ingot, f.o.b., ₩ ton	100 0 0	@	0 0 0
Fine Straits (in warehouse), ₩ ton	93 10 0	@	0 0 0
Banca (in warehouse), ₩ ton	93 0 0	@	0 0 0
Fine Australian (in warehouse), ₩ ton	93 10 0	@	0 0 0

TIN PLATES.

MF. best charcoal, IC, f.o.b., ₩ cwt.	1 6 0	@	0 0 0
Crown Talbot charcoal, IC, f.o.b., ₩ cwt.	1 1 6	@	0 0 0
Crown Talbot best coke, IC, f.o.b., ₩ cwt.	1 0 0	@	0 0 0
R.K.P. coke, IC, f.o.b., ₩ cwt.	0 18 0	@	0 0 0

QUICKSILVER.

(In warehouse), ₩ 75 lb	5 10 0	@	0 0 0

SPELTER.

Silesian and Rhenish London and outports (in warehouse)	15 15 0	@	16 0 0
English Crown at Swansea, f.o.b., ₩ ton	16 5 0	@	0 0 0

ZINC.

Sheet, No. 8 and upward, f.o.b.	19 10 0	@	0 0 0

LEAD.

English pig, W.B., £13. 2/6; L.B., £14, f.o.b.	13 10 0	@	0 0 0
Sheet and bar, f.o.b., ₩ ton	14 5 0	@	0 0 0
Pipe, f.o.b., ₩ ton	14 12 6	@	0 0 0
Patent shot, f.o.b., ₩ ton	16 5 0	@	0 0 0
Red, f.o.b., ₩ ton	16 10 0	@	0 0 0
White, f.o.b., ₩ ton	20 10 0	@	0 0 0
Genuine ground, f.o.b., ₩ ton	22 0 0	@	0 0 0

The following are all subject to 2½ discount for cash on one month's terms:

STEEL BALING HOOPS.

	Per ton. £ s. d.		
2½ in. to 1¼ in. x to 16 B. W. G	at	9	0 0
1¾ in. " 1½ in. x " 18 "	at	9	10 0
1 in. " ⅞ in. x " 20 "	at	10	0 0
⅞ in. x " 21 "	at	10	10 0
¾ in. and ⅝ in. x " 20 "	at	14	0 0
½ in. & 7-16 in. x " 20 "	at	15	0 0

Cutting to exact lengths, extra.

STEEL BARS.

	Per ton. £ s. d.		
Flats, 4 in. to 2 in. x ⅜ in. upward	at	7	0 0
" under ⅜ in. to ¾ in. thick	at	8	5 0
Squares, 2 in. to ⅞ in.	at	8	10 0
¾ in. to ⅜ in.	at	9	0 0

CHAINS, CABLES AND ANCHORS.

Common Short Link Rigging Chain.

Inch	3-16	¼	5-16	⅜	7-16	½	9-16
Per cwt.	22/9	18/6	17/0	15/9	14/9	13/9	13/3
Inch	⅝	11-16	¾	13-16	⅞	15-16	1
Per cwt.	13/0	12/9	12/5	12/3	12/1	11/9	11/9

Tested ditto 3d. per cwt. extra.

Best Tested Crane Chain, Short Link.

Inch	3-16	¼	5-16	⅜	7-16	½	9-16
Per cwt.	41/0	32/9	24/9	20/9	18/0	16/9	16/3
Inch	⅝	11-16	¾	13-16	⅞	15-16	1
Per cwt.	15/9	15/3	14/9	14/9	14/6	14/6	14/6

Best Ship Cables Stud Link (Maker's Test).

Inch	¾	13-16	⅞	15-16	1	1 1-16	to 1¼
Per cwt.	12/2	12/0	11/10	11/8	11/6	11/5	

Best Ship Cables, Short Link (Maker's Test).

Inch	¾	13-16	⅞	15-16	1	1 1-16	to 1¼
Per cwt.	12/6	12/5	12/3	12/1	11/11	11/10	

Best Ship Cables, Stud and Link (Lloyd's Test).

Inch	¾	13-16	⅞	15-16	1	1 1-16	to 1¼
Extra	4/3	3/9	3/9	3/9	3/6	3/6	

Trek Tow Chain (made from Charcoal Iron).

Inch	¾	7-16
Per cwt.	28/6	27/6

Trek Tow Chain (made from Best Iron), Middle Link, assorted sizes, 2 to 10, 12 or 14 Oxen, 18/ per cwt.

Trek Tow Chain (made from Best Iron), Short Link, assorted sizes, 2 to 10, 12 or 14 Oxen, 15/ per cwt.

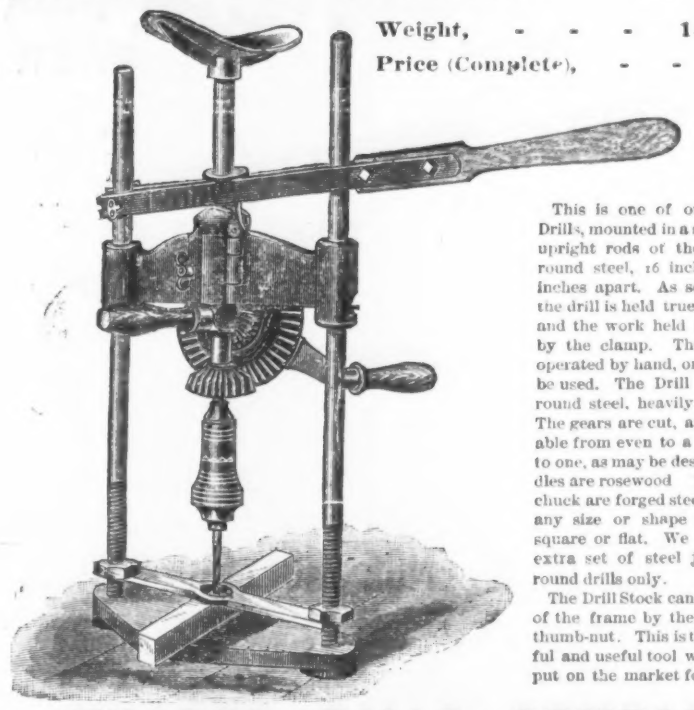
Anchors, Iron or Wood Stock, (Private Test).

Cwt.	1	2	3	4	5 to 20	20 to 30
Per cwt.	14/3	14/3	14/3	14/3	14/9	15/9

Anchors, Iron or Wood Stocks (Lloyd's Test).

Cwt.	1	2	3	4	5 to 20	20 to 30
Per cwt.	19/6	17/6	16/6	16/0	15/9	16/9

MOUNTED BREAST DRILL.



Weight, - - - 13 Pounds.
Price (Complete), - - - $6.

This is one of our best Breast Drills, mounted in a steel frame. The upright rods of the frame are ⅝ round steel, 16 inches high and 8 inches apart. As seen in the cut, the drill is held true by the frame, and the work held firmly in place by the clamp. The lever feed is operated by hand, or a weight may be used. The Drill Stock is of ⅝ round steel, heavily Nickel Plated. The gears are cut, and are changeable from even to a speed of three to one, as may be desired. The handles are rosewood. The Jaws of the chuck are forged steel, and will hold any size or shape shank, round, square or flat. We also put in an extra set of steel jaws for small round drills only.

The Drill Stock can be put in or out of the frame by the half-turn of a thumb-nut. This is the most beautiful and useful tool which has been put on the market for many years.

MILLERS FALLS COMPANY,
74 Chambers Street, New York.

No Sir! You can't GIVE me your Plow! I have tried them all, and would'nt give the IMPERIAL for all the Plows I ever saw. I tell you, sir, it is THE BEST PLOW IN THE WORLD and You Know it. No Mistake!

SEND FOR CIRCULAR AND PRICES.

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Manufacturers of
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CANTON, O. GENERAL AGENTS.—N. B. & W. D. Merryman, Baltimore, Md.; Graham, Emlen & Passmore, Phila., Pa.; Scoble, Parker & Ransom, Pittsburgh, Pa.; L. G. Sherman & Co., Providence, R. I.; E. A. Almond, Indianapolis, Ind.

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CELEBRATED
WOOD WORKING MACHINERY

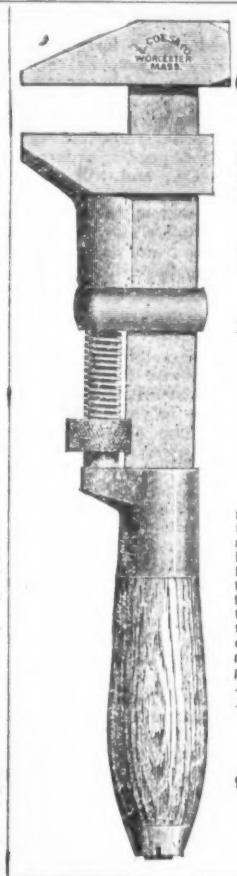
For Car Shops, Planing Mills, &c.
Also Machinery for all purposes. Correspond with us.

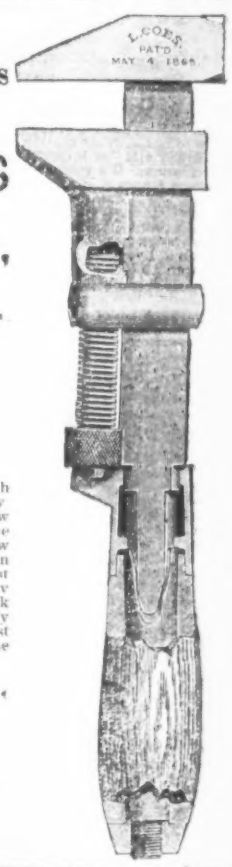
L. COES'

Genuine and Mechanics PATENT

Screw Wrenches

MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.
ESTABLISHED IN 1830.





Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped

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Worcester, Mass.
Warehouse,
97 Chambers and 81 Reade Sts
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DURRIE & McCARTY,
Sole Agents.

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Forged Horse Nails.
MANUFACTURED BY THE
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HOT FORGED AND COLD HAMMERED POINTED, MADE OF BEST NORWAY IRON AND WARRANTED.
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MOWER
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Now, why buy a worthless mower?
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1883.

PENNSYLVANIA

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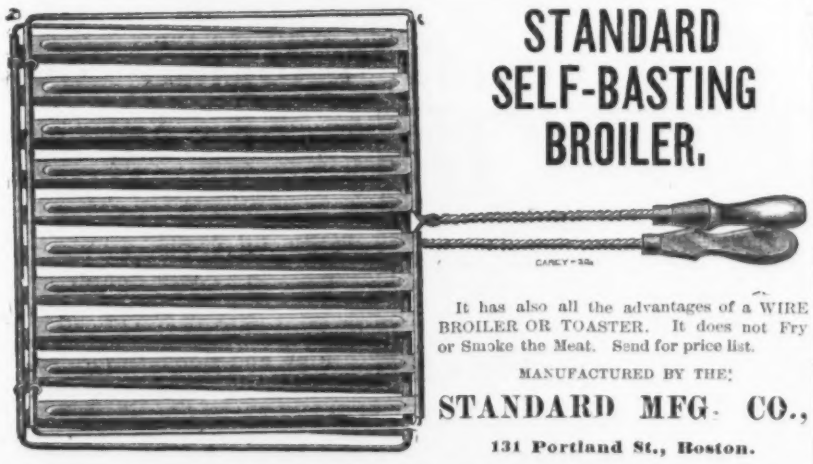
STANDARD SELF-BASTING BROILER.



It has also all the advantages of a WIRE BROILER OR TOASTER. It does not Fry or Smoke the Meat. Send for price list.

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131 Portland St., Boston.

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HARDWARE MANUFACTURERS.
LIGHT CASTINGS A SPECIALTY.
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YOUNGSTOWN, O.,
Manufacture a full line of
FORSYTH'S STANDARD SCALES
Counter, Portable, Dormant, Stock and Hay, and R. R. Track
SCALES.
Call Special Attention to their
SUSPENSION HAY & R. R. TRACK SCALES.
Also, Warehouse Trucks and Letter Presses.
PRINCIPAL WAREHOUSES,
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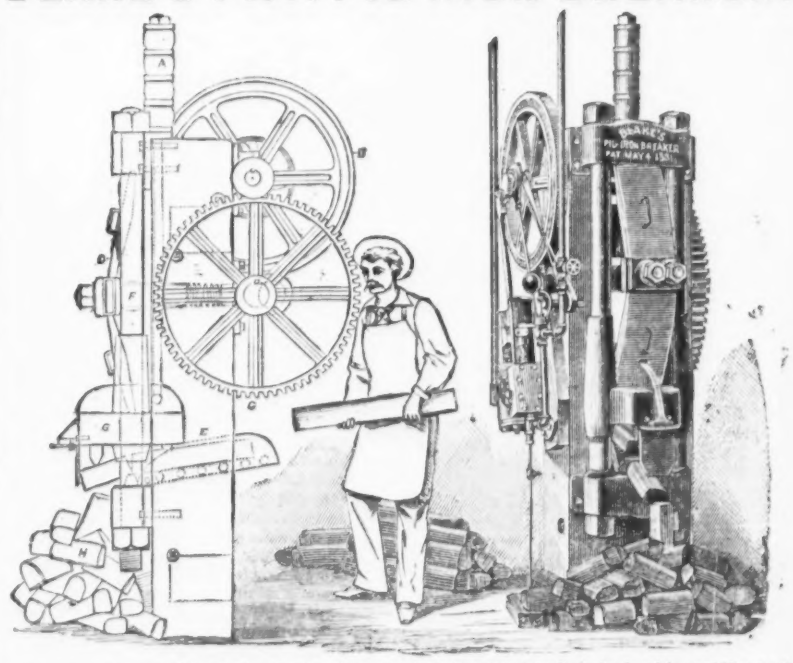
BLAKE'S PAT. PIG IRON BREAKER.



A new and successful machine for breaking pig iron into any length desired, with rapidity and economy. Besides saving in cost of breaking by hand, it secures the greatest economy in melting. Several machines already in use. Every machine guaranteed against breakage of parts. Requires but three horse-power. Can be run by belt or have small engine attached.

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BLAKE CRUSHER COMPANY,
Sole Makers, 85 Orange Street, NEW HAVEN, CONN.

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IN THE MARKET ARE THE
Nos. 1, 2 and 3 "King" for
FAMILY, RESTAURANT AND HOTEL USE,
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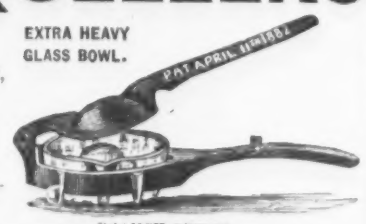

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Manufacturers of
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Exhibitions of 1862, 1865, 1867, 1872, 1873, and only award and medal for Noiseless Steel Shutters at Philadelphia, 1876; Paris, 1878, and Melbourne, 1881.

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Noiseless Self-Coiling Revolving STEEL SHUTTERS,
FIRE AND BURGLAR PROOF. ALSO IMPROVED
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Manufacturers of all descriptions of Testing Machines. Tests made daily.

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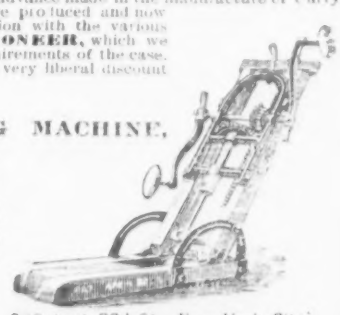
In addition to our **PERFECT COMB,** which is to day in the hands of a majority of the jobbing trade throughout the United States and Canada, there having been of late a growing demand for a Curry Comb cheaper than the Perfect, and better than the ordinary styles offered in the market, we have decided to maintain the position we have always occupied as pioneers in every advance made in the manufacture of Curry Combs. To this end we have produced and now offer to the public, in connection with the various styles of the Perfect, the **PIONEER,** which we believe will meet all the requirements of the case, and from prices in catalogue a very liberal discount will be made to the trade.

Our improved
PATENT BORING MACHINE,
with our improved adjustable crank, by which a greater or less leverage is obtained, enables us to offer a machine that will perform its work with less labor than any machine heretofore placed the market.



LAWRENCE CURRY COMB CO., 309 East 22d St., New York City.

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, Feb. 15, 1883.—*Metals.*—The demand has been slack, but toward the close it begins to revive. Copper and Tin improving and Lead and Spelter declining. We quote *Copper*—Chili Bars, 170 @ 172.50 francs ₩ 100 kg.; Ingots and Slabs, 177.50; Best Selected, 182.50 and Pure Corocero Ore, 192.50. *Tin*—Banca, 255; Billiton, 252.50, and Straits, Australian and English, 250; *Lead*, 33.25 @ 34.25, and *Spelter* 41 @ 42.50. *Iron.*—In this city there has been a heavy market, causing prices to weaken. Merchant Iron sold at 19 francs ₩ 100 kg.; Flooring ditto at 19.50; Corners, 20, and Sheets at 24. Finally, however, a firmer feeling has begun to prevail, dealers at length having agreed to combine and put up the price 25c., which is more in accordance with the ruling in the Iron regions. In the North and West prices are held higher by makers than the Iron sells at Paris. The Haute Marne is, however, not very firm. Steel works are generally busy, and the Northeastern works succeeded in selling to the railroads in that district some Steel Rails at 19.25, deliverable at Maubeuge. Production in France in 1882, in round numbers, has exceeded 2,000,000 tons Pig Iron, 1,100,000 tons Finished Iron and 480,000 tons Steel. So far we possess 5 basic converters, but their number will soon be doubled. The import of Machinery, Iron and Steel Steamers, Tools and Hardware into France last year summed up 177,000,000 francs worth, against 113,000,000 in 1881, and 93,000,000 in 1880; whereas there were exported thereof 92,000,000 francs in 1882; 97,000,000 in 1881, and 90,000,000 in 1880. There is still to be spent on public works 6,500,000,000 francs, of which 289,000,000 in 1884. This embraces 114 secondary railroad lines of together 3500 miles. *Coal.*—Although the output is large, the demand is fully up to it.

BELGIUM.

(Moniteur Industriel.)

BRUSSELS, Feb. 15, 1883.—*Iron.*—Pig Iron is still firmly held, and rolling-mill owners make an effort to put up their prices, but so far have failed to accomplish their aim, there not being enough of a demand to come to their assistance. While this is the case the position of our rolling mills becomes more precarious week after week; they therefore look forward with anxiety toward the opening of the spring demand. Everything, indeed, now turns on the more or less animation which the spring season shall display. Should there be any disappointment on that score, we may witness a sudden caving in of prices. Meanwhile Pig Iron has been steady at 5.10 @ 6.25 for Puddling, while Foundry has ranged between 7.25 and 7.50. English Pig has been barely upheld at 6.30; Luxembourg at 5.75 @ 6.25. At Charleroi, besides Athus Pig, Halanzy Pig has made its appearance, meeting with a fair success. Merchant sells there at 13 francs. In our market No. 2 Merchant has sold at 14 francs and No. 3 at 15. Common Sheets have brought 18; No. 3, 20; No. 4, 28; Commercial, 24, and Fine, 26. No. 1 Merchant we can quote 13.25. Steel Rails, 30 kg. to the running meter, sell at 15 francs; Steel Hoops at 23; do. Axles at 24. The large works in Belgium are still tolerably busy, and have during the week even received some commands for Flooring Iron, Sheets and Steel Rails; but works of second and third magnitude, although as yet engaged in filling previous orders, are afraid of buying Pig ahead till they can see their way clear, the high price of Pig holding no inducement to them to in any way anticipate laying in stock. *Metals* meanwhile remain steady at 254.50 francs for Tin. Copper is worth 177. Lead 33 and Spelter 39.25. *Coal*, though fresh orders rather slacken, remains tolerably active on old ones; at tolerably firm prices a moderate trade continues to be transacted.

GERMANY.

(Cologne Gazette.)

DUSSELDORF, Feb 14, 1883.—*Iron.*—Pig remains dull; in good qualities of Puddling and Foundry there is nevertheless a firm feeling. So far, the demand for Merchant Iron is not brisk, consumers still holding back; it is, however, no secret that stocks in the hands of dealers are exhausted, so that with the advent of spring a lively trade may be looked forward to with confidence. Boiler sheets have been fully sustained in price, whereas in thin ones only a limited business is done. We quote, on the spot: Prime Spiegel, 72 marks; White Pig, No. 1, 62; Luxembourg Pig, 46; Charcoal do., 84; Foundry No. 1, 75; No. 2, 72; No. 3, 66; English Pig, No. 3, at Ruhrort, 64.50; do. Bessemer at port of shipment, 52.6 @ 54; German do., 65.50; Merchant, 140 @ 165; Sheets, 200 @ 220. *Coal.*—Notwithstanding the mild winter, the demand for both Coal and Coke has, on the whole, been satisfactory.

(Borsenhalle.)

HAMBURG, February 14, 1883.—*Iron.*—The situation of the Iron market in Germany is not calculated to inspire confidence. Orders have become scarce; the smaller works have few of them left. Curtailment of work is the order of the day. Thus, in most Iron-producing regions, the output of Pig has been reduced 15 % and that of Finished Iron between 10 % and 20 %. Prices have meanwhile varied very little. Puddling Pig is held with a tolerable degree of firmness, but Merchant Iron has been considerably shaded in Westphalia. As for machine shops in general, they are still well engaged; Locomotive makers in particular have, so far, little cause for complaint in this respect, several fresh adjudications that came off during the week having brought them additional work. *Coal.*—The outlook has become rather gloomy; the mild weather has kept within narrow limits the demand for domestic use, while dullness in the iron regions of Westphalia and Silesia causes Industrial Coal to be neglected. The tendency has become decidedly downward; in order to check the decline reduced production has to be resorted to. *Metals.*—Little doing. Lead is dull at 14.50 @ 15 marks, German; Copper is quiet at 73 @ 78; Tin a little better at 104 @ 109, and Spelter inactive at 17 @ 17.25 marks ₩ 50 kg.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Feb. 11, 1883.—*Tin.*—Since the Government sale this metal has continued to tend upward, Billiton on the spot gradually recovering from 55.50 guilders ₩ 50 kg. to 57, and May delivery even brought 57.75 while Banca deliverable from the said auction sold at 57.50. The market closes quiet at 56.75 for Billiton and 57.50 for Banca.

INDUSTRIAL ITEMS.

MAINE.

The Deer Isle Zinc and Silver Mining Co. have been incorporated, with a capital of $1,000,000. The company will mine zinc and other ores and minerals, manufacture articles of the same, and are also empowered to construct railroads for the transportation of their product.

CONNECTICUT.

The Winchester Arms Co., of New Haven, are contracting for 30,000 rifles. On the 20th the manufacture of 5000 brass receiver guns will begin. Then 15,000 of the latest improved rifles will be made. Work on 15,000 bayonets has begun.

There were 112,000 square feet of gravel roofing required for the new buildings of the Bridgeport Malleable Iron Co.

The Norwich Nickle Plating Co. will probably commence the manufacture of silver-plated goods shortly.

The annual product of the Derby Bit Co., of Ansonia, has a value of $50,000.

MASSACHUSETTS.

In order to make room for increasing business in pickers, cards and other machinery, and at the same time to protect the customers of the Phenix Machine Co., Messrs. Whitehead & Atherton (who have held a controlling interest in said company) have, under their authorization, sold out their patents, patterns, stock in process, good will, &c., to the Hopedale Machine Co., of Hopedale, Mass. The Hopedale Machine Co., have undertaken to fill all pending orders of the Phenix Machine Co., and will in the future build such warpers as have been furnished by the latter company should their customers prefer that kind. They intend in the future to keep in the front rank, so far as improvements and workmanship are concerned, and will endeavor to give their customers satisfaction.

NEW YORK.

The copartnership heretofore existing between John F. Rathbone, Grange Sard, Jr., Robert S. Oliver, Edward Bowditch and William H. Sard was recently dissolved by mutual consent. The object of this dissolution was to effect a reorganization under the incorporation laws of the State. The business heretofore conducted by this firm will for the future be managed by a corporation organized under the laws of the State of New York, its corporate name being the same as that of the old firm. The capital is placed at $800,000. The principal offices are at Albany, N. Y., with branch offices at Detroit, Mich., and Chicago, Ill. John F. Rathbone is president of the new organization, with Grange Sard, Jr., first vice-president and general manager. William H. Sard holds the office of second vice president and will continue as manager of the Chicago branch. Edward Bowditch is secretary and treasurer and Robert S. Oliver superintendent. Walter P. Kellogg is the Detroit manager. From this distribution of duties and responsibilities among the incorporators, our readers will see that the reorganization will not in any respect change the management of the concern.

PENNSYLVANIA.

The Colebrook Furnaces, at Lebanon, during the week ending on the 10th inst., largely exceeded their former best record. The daily product of these furnaces for the week was as follows, in tons of 2250 pounds:

February.....	4	5	6	7	8	9	10	Total.		
No. 1 Furnace.....	85	85	84	91	94	94	93	= 626	tons.	
No. 2 Furnace	82	72	86	83	85	75	97	= 581	"	
Total.....								1207	tons.	

The fuel used per ton of pig iron made at No. 1 Furnace was 923 pounds of anthracite coal and 1582 pounds of coke; total, 2506 pounds. The fuel used at No. 2 Furnace was 802 pounds of anthracite coal and 1605 pounds of coke; total, 2407 pounds.—*Iron and Steel Bulletin.*

The Stony Creek Rolling Mill, at Norristown, owned by J. H. Boone, started up last week, after two weeks' idleness.

Henry Clay Furnace No. 1, at Reading, has been blown in, after undergoing extensive repairs.

Rosena Furnace, at Newcastle, is making about 700 tons per week. Mr. A. M. Robbins, of that town, is in charge.

The new nail factory at South Williamsport will be started in the course of a week. The men are on hand and ready to go to work. There is talk of building a rolling mill and nail factory in Williamsport during the coming summer.

PITTSBURGH AND VICINITY.

The Adams direct process of producing iron from the ore, lately tried at Glenwood, will receive another test, which, if satisfactory, will lead to the formation of a large company. The right to use the Adams process in Allegheny County is owned by Leishman & Snyder, who have made an arrangement to divide the territory. Captain Vandergrift, Joshua Rhodes, H. S. A. Stewart, R. G. Loomis and others have been dickering with Leishman & Snyder for some time, and yesterday formed an agreement by which the right to manufacture iron by the Adams process in Allegheny County was passed over to them, with a reservation allowing Leishman & Snyder to manufacture 100,000 tons per year. The contract between the parties is provisional, and depends for fulfillment entirely upon the outcome of a test. While the work done at Glenwood was pronounced perfect, the men who are interested in this contract never take information at second-hand. They will build a furnace at the Pennsylvania Tube Works and thoroughly try the merits of the process. Should they be satisfied, the bargin will close. To make this test will require an outlay of about $6000, and if success is achieved a plant of large proportions will be erected by a company which Vandergrift and the others intend to form. In addition to Allegheny County, these men have the refusal of the right to Bedford County, where they own large ore fields, and will take it if the coming test is all right.

The United States Tin Plate Works, at Demmler Station, on the Baltimore and Ohio Railroad, are to be rebuilt by J. H. Demmler & Sons, but not for the manufacture of tin plate. The experience of former years in making tin plate and the damper put upon the business by the tariff demonstrated that the time is not ripe for American tin plate. Instead of tin plate, the new works will be devoted entirely to sheet iron. Much of the old machinery can be used for this purpose, and, besides, the mill had a very good run of custom for sheet iron before the fire. The new works will be complete in every detail, the intention of the firm being to have a plant equal to any in the country and capable of producing the finest grades of iron. The work of construction will be begun as soon as the *debris* of the fire is cleared away, and it is expected that the mill will be in operation within 30 days from the time of commencing the rebuilding. Superintendent Kronemyer states that all possible speed will be used in rebuilding, and he expects to make iron before April 1.

OHIO.

The Bellaire Nail Works have just ordered another 8 per cent. dividend. This is 13 per cent. in six months and 48 per cent. in two years.—*Cleveland Trade Review.*

The Cleveland company recently organized, with $100,000 capital, to manufacture the pulp seamless barrel invented by Mr. M. L. Deering, expect soon to get to work. They are having a large machine built by the City Machine Co., to cost $5000 and to be done by the 1st of April. Meanwhile they have applied for patents in all the principal countries of Europe.

Woodruff & Son's large stove foundry, at Salem, which has been partly idle for some time, is again in full operation.

In December and January the Cleveland Twist Drill Co., did the largest business of any two months since the establishment started. They have added to their plant four Pratt & Whitney lathes, and are having some special turning lathes built in Cleveland. They are constantly adding milling machines of their own manufacture to the plant.

Among the parties reported to be negotiating with the New York and Ohio Iron and Steel Co. in regard to the purchase of their mill are Judge Wright; Ellery & Co.; a syndicate supposed to represent the Steam Mfg. Co.; W. B. Davidson, representing New York capitalists, and the Standard Tube Co. It is understood that, should the company fail to sell the mill, they will put in 100 nail machines.

The Forest City Iron Works, of Cleveland, are in full operation again.

Owing to the failure of Mr. H. C. Ayer, the creditors of Brown, Bonnell & Co. petitioned the court for the appointment of a receiver for the firm, and Mr. Fayette Brown, of Cleveland, was named as such. The works were at once shut down, with the exception of the blast furnaces, and on February 21 Mr. Brown began the work of taking an inventory. Upon being interviewed, he stated that the business of making an inventory would be pushed as expeditiously as possible, and that at its conclusion all the mills would be started and run without cessation, as to have them stand idle would certainly cause a loss and depreciate the value of the property, and that, properly managed, they could be operated at a profit to all concerned. All the creditors express themselves as highly pleased at the selection of Mr. Brown as receiver, and predict that the interests of all concerned will be protected by him.

The following coal and iron companies of the Hocking Valley have consolidated under the name of the Columbus and Hocking Coal and Iron Co.: the Akron Iron Co., at Buchtel; the Crafts Iron Co., at Greendale; the Thomas Iron Co., at Gore; the Winona Iron Co., at Winona; Moss & Marshall and the Thomas Coal Co., of New Straitsville; together with the coal properties of T. Longstreth, at Nelsonville and Longstreth. The authorized capital of the combination is $5,000,000, and the property owned by it includes five of the largest furnaces in the Hocking Valley and 8000 acres of mineral lands. Other coal properties of the valley will be taken into the company within the next 30 days.

The Buckeye Stove Company, of Cleveland, have held their first annual meeting. The following officers were re-elected for the ensuing year: President, S. T. Everett; vice-president, W. D. Watterson; treasurer, M. G. Watterson; secretary, W. H. Patterson; superintendent and general manager, A. E. Bronson. The annual report submitted at this meeting showed a high degree of prosperity for the company during the past year. The demand for Buckeye goods is reported so large that, in order to meet it, the company resumed operations in their foundries three weeks ago, and are now working full time and full-handed.

INDIANA.

Cobb's Iron and Nail Co., of Aurora, are out in a postal-card circular as follows: "Dear Sir: Instead of our iron and nail mills and railroad track being cut down and washed away, as some one falsely reported in the Cincinnati papers of the 12th inst., we are happy to inform our friends and customers at home and abroad that our factories are still standing and almost unharmed, and will be in active operation next week, without our workmen having missed a pay day, after having passed through a flood second only to that of Noah's time." The plate-glass works of W. C. De Pauw, at New Albany, were not so fortunate as Cobb's Iron and Nail Co. The works were flooded on the night of February 13, the fires extinguished in the furnaces, and damage done to the extent of at least $10,000.

MISSOURI.

A somewhat unsuccessful start was made last week with green hands at the Vulcan Steel Works, of the St. Louis Steel and Ore Co. With more training, however, the management expect to be in successful operation in a few days.

WASHINGTON TERRITORY.

We are in receipt of a communication from J. M. White, superintendent of the Puget Sound Iron Company, who is now engaged in the erection of a blast furnace at Irondale, Washington Territory. Mr. White says: "The furnace erected at this place during 1880 has been taken down, having been declared by the original owners unprofitable and not of modern plan. The furnace I am now building will have an iron shell, on columns, 51 feet high by 10 feet in diameter of bosh, and will be in every way first-class. It will be called Irondale Furnace. It and the Clipper Gap Furnace, in Placer County, California, are both similar to the Menominee Furnace, Michigan—all erected by me. The ores to be used are magnetic and hematite, containing respectively 70 and 44 per cent. of the metallic iron." The main office of the Puget Sound Iron Company is at San Francisco, California.—*Iron and Steel Bulletin.*

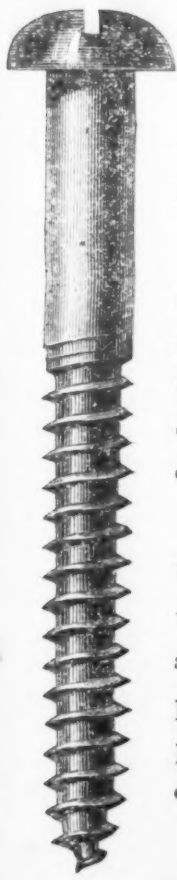
PHILADELPHIA SCREW CO., Limited

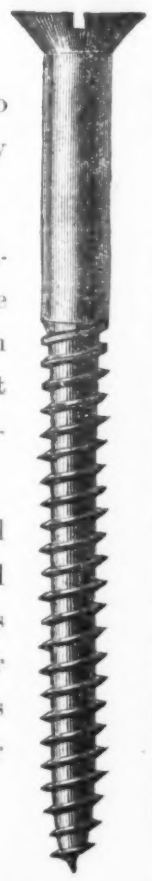
Twelfth and Buttonwood Sts., PHILADELPHIA,

MANUFACTURERS OF

IRON AND BRASS WOOD SCREWS

OF EVERY DESCRIPTION.





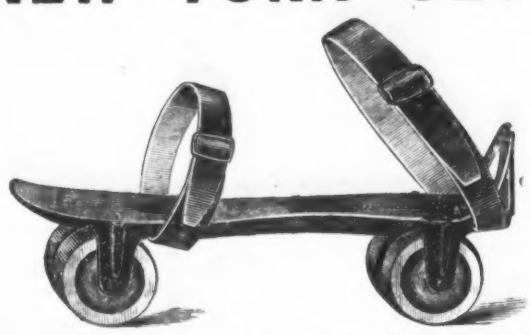
Quality, finish and tests as to strength guaranteed equal to any in the market.

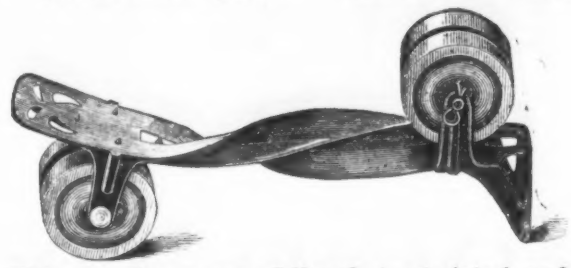
Desiring to give the fullest advantage to our customers, we have withdrawn all our accounts from Commission Houses, and solicit direct correspondence from Dealers in all parts of the country.

Having placed an additional 100 Horse-Power Engine, and with otherwise improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts.

A FULL LINE IN STOCK.

NEW YORK CLUB ROLLER SKATES.





This cut shows one of the skates twisted and bent cold.

The lightest, easiest working and most durable Roller Skate ever made. The frames are made from a fine quality of decarbonized steel, and cannot possibly be broken in using. The heel support is preferable to the ordinary one of leather, as it cannot wear through. Besides these, the skate has many other advantages, and the price is low as compared with others. Patented June 21, 1881.

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522, 524, 526, 528 and 530 West 20th Street, - - - - - NEW YORK.

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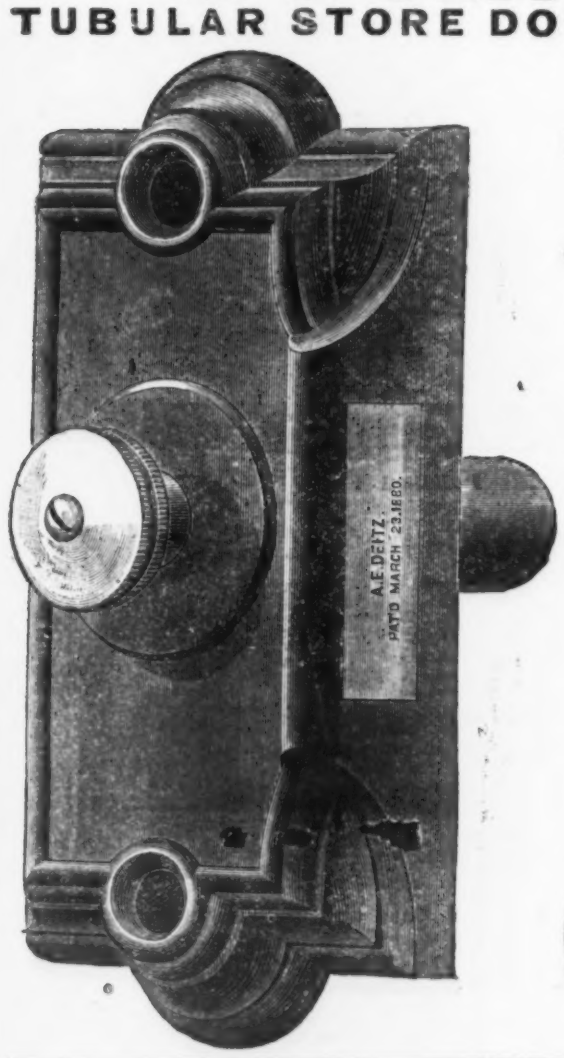
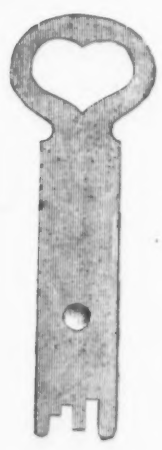


Lock No. 172.



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SOLE AGENTS,

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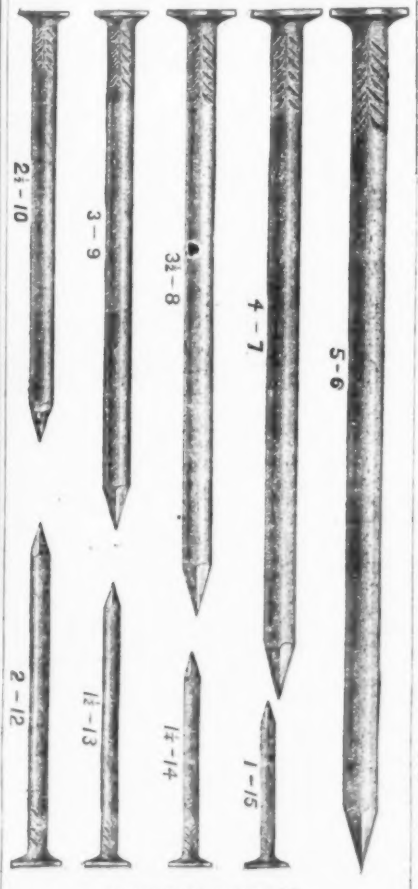
THE HP NAIL CO.,

CLEVELAND, OHIO.,



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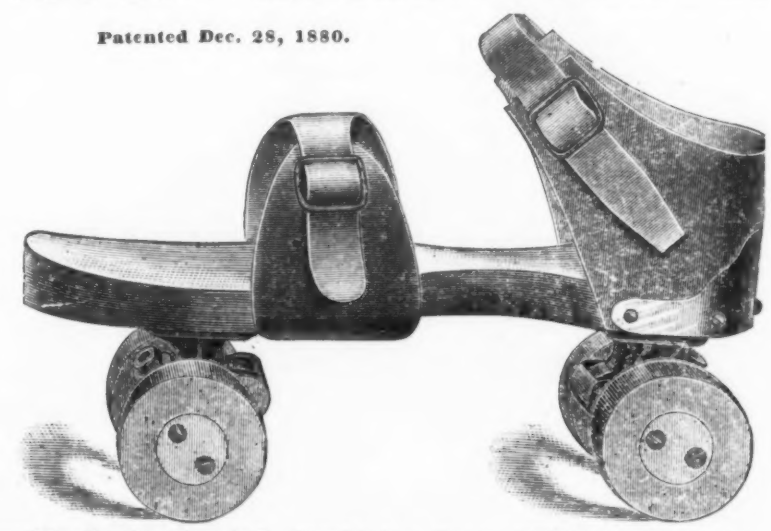
WIRE NAILS

OF ALL KINDS.

Barbed or Plain Steel, Iron and Brass Nails, Cast Steel Wire Brads, Cast Steel Wire Finishing Nails, Cigar Box Nails, Escutcheon Pins, Wagon Nails, Clinch Nails, Hinge Nails, Wire Spikes for Track, Bridge and Dock Work, Tinned Nails, Galvanized Nails.

PISTON ROLLER SKATE.

Patented Dec. 28, 1880.



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THE MOST COMPLETE SKATE IN THE MARKET.

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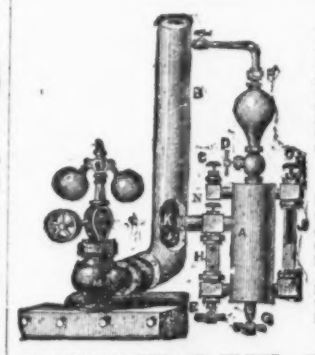
SIGHT FEED LUBRICATOR CUPS,



For oiling valves and cylinders of steam engines by the only perfect method, THROUGH THE STEAM PIPE. The oil passes IN SIGHT, drop by drop, into the column of steam, where it vaporizes, thus becoming a STEAM LUBRICANT, oiling perfectly every part reached by the steam. Any CLEAN OIL, black or white, light or heavy, may be used. Saves from 50 to 90 per cent. in oil and wear of machinery, thus paying for itself several times a year. A cup will be sent to responsible parties on twenty days' trial if desired. In ordering, give diameter of cylinder.

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HUGUNIN SASH BALANCES,

Having Improvements Made in 1882.

No Cords, No Weights, and Just as Good, at one quarter the Cost (for Medium and Light Sashes.)

Invaluable for old buildings having no facilities for weights. The genuine goods have "R. B. Hugunin, Patentee and Solely Authorized Maker" cast directly upon them, and the card boxes containing them have the dates of the patents covering the Balances. Beware of a worthless fraud imitation, having the copied date of one of my minor patents cast upon them to deceive the public, as all handlers of these fraud goods will be prosecuted for infringement. Orders at factory prices filled by addressing

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THE COLT DISC ENGINE.

The Best and most Economical High Speed Engine made.

WILL OUTWEAR ALL OTHERS.

SPECIALLY SUITABLE FOR DYNAMO ELECTRIC MACHINES.

A MOST RELIABLE ELEVATOR AND Hoisting Engine

No Dead Centre, and will Start in any Position.

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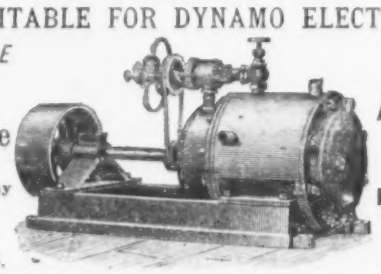

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Builders' Hardware,

DOOR LOCKS & KNOBS

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Fine Bronze Trimmings.

½ Size of Filter.

PRICE, 50 Cents each. Mailed Free, with Price Lists, to Agents.

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No house should be without one; also indispensable to travelers. It is a genuine Filter, and will last for many years. This Portable Filter is fitted with a very elastic India Rubber Tube of the best quality, which slips on and off any ordinary House Faucet.

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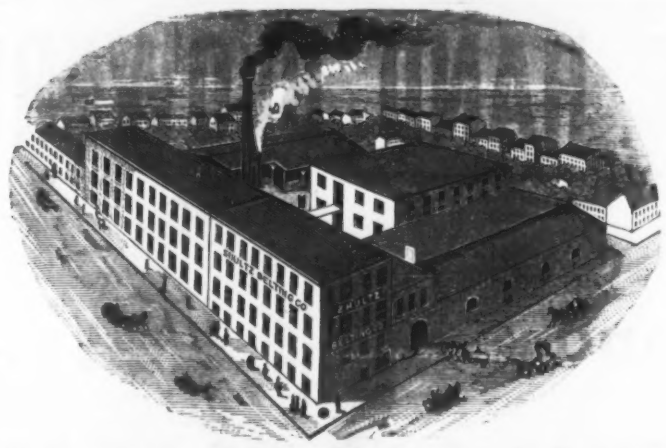

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Shultz Patent Fulled Leather Belting And Lace Leather.

Our BELTING is made of Leather, tanned on the surfaces only; the interior (which is the Fibre and strength of the hide) is not tanned, but Rawhide fulled and softened by our patented process. Our Belting is more pliable, and hugs the pulley better, and transmits more power than any other belt.
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VALVES FOR FURNACES and IRON WORKS.

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DEAR SIRS: We have used your Valves for blowing blast furnaces. They are the best we have ever used, stand the heat well, and outwear any others. Have some in constant use three years.
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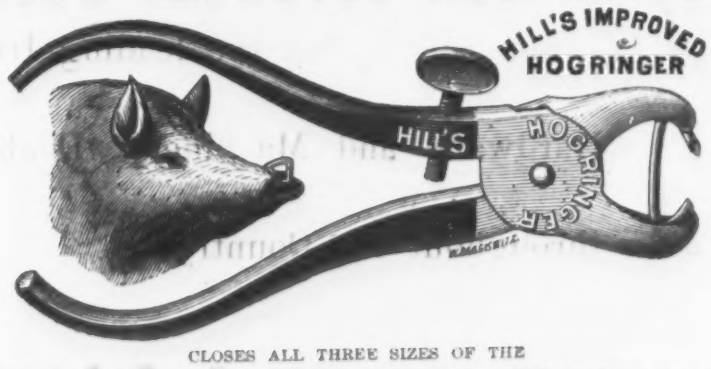

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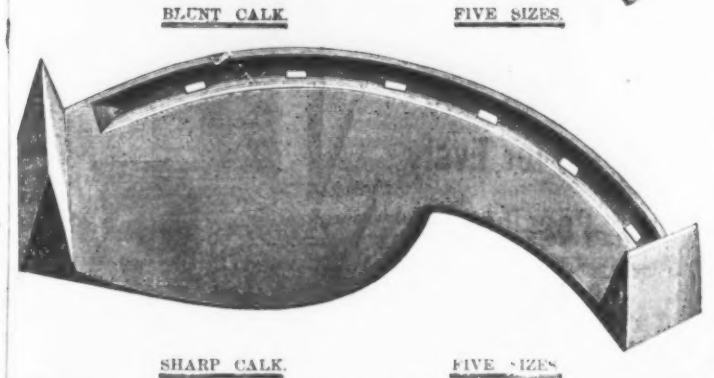
MOUNT CARMEL OX SHOES,

With Steel Toe Calks.

BLUNT CALK. FIVE SIZES.



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The Best and Cheapest Shoe Made.

SUPERIOR TO ALL OTHERS IN THE FOLLOWING POINTS:

Finished Ready for Nailing On.
Longer and Better Shaped Calks.
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No Re-Punching Required.
Deep Channel for Nail Heads.
Outwear Any Other Shoe.

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ONE OF THE VERY BEST TOOLS EVER INVENTED.

It combines greater Strength, Convenience and Durability than was ever obtained in a Common Driver. Sells readily and gives Perfect Satisfaction.

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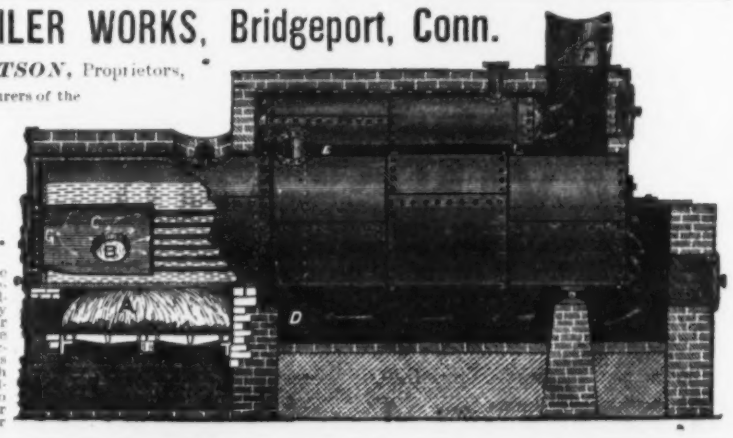

Fourteen years' use proves them the most desirable and reliable boiler known. Gives dry steam. The process for the combustion of the gases is in the construction and setting. Burns any fuel; obtains as much result from it as any boiler or setting, with no more cost and greater durability. ☞ Send for descriptive circular.

NEW CHAMPION FORCE PUMP.

HAS

Vacuum Chamber and Air Chamber,

PRODUCING

A CONTINUOUS FLOW OF WATER,

Both in Suction and Discharge,

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With hose attachment it is valuable as a fire protection, and for sprinkling lawns, gardens, &c.
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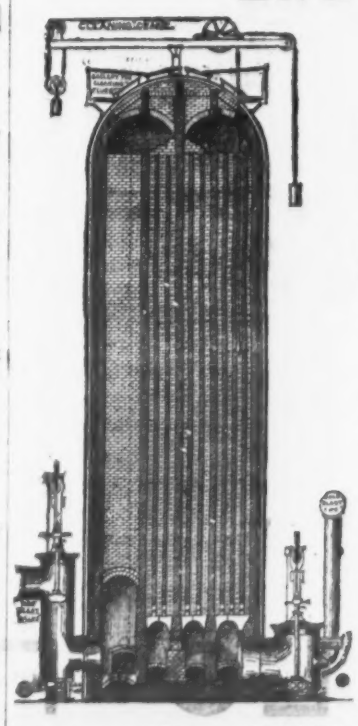

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Contract for erecting the same. Also, for Building and Replacing all types of Blast Furnaces. Combining Economy with Efficiency and Modern Improvements, wherein the output of Furnaces is increased fully 50 per cent. and the fuel consumption decreased in the same ratio.

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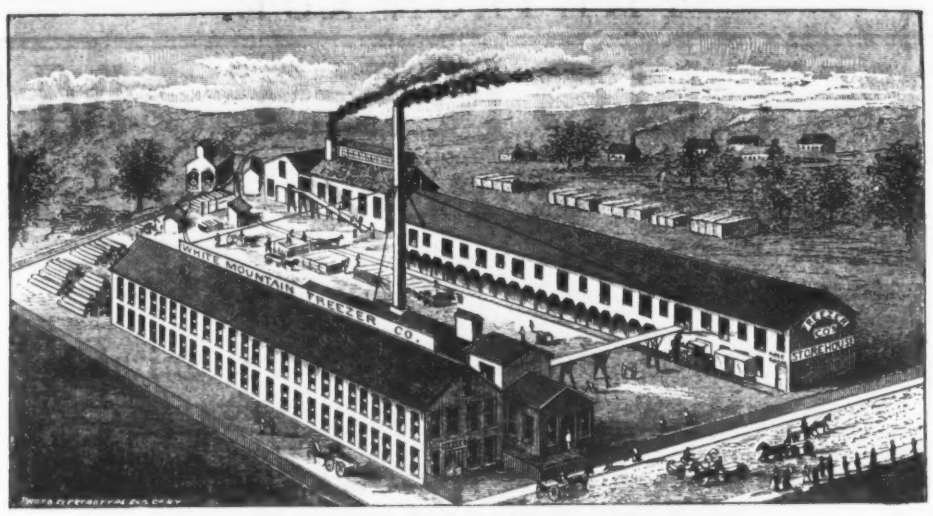
Sizes, 15, 20 and 25 quarts.



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White Mountain Freezer Ready to Operate.
Sizes, 2, 3, 4, 6, 8, 10, 15, 20 and 25 quarts.

If You Want a Really Good

ICE CREAM FREEZER

Buy Sands's Triple-Motion "White Mountain."

The only Freezer ever made or patented having three motions. Can turning one way. Outside Beater and Cream Scraper combined, with floats extending to center, turning opposite to Can. Inside Beater, with floats extending outward, turning opposite to Outside Beater, thereby making three simultaneous motions. **It is utterly impossible for any Single-Beater Freezer to produce the same results.** They freeze quicker than any other on the market, thereby saving time, ice and salt. The Tubs are chemically filled and are *Water Proof.* **No Zinc in contact with Cream, but Tin instead.** Oxide of zinc is a well-known poison. "Never put anything into the Human Stomach prepared in vessels coated with Zinc."—*The Metal Worker.* All outside Irons Galvanized. Packing Tubs and Cans, all sizes, wholesale and retail. Sold by the Trade everywhere. Send for Circular and Price List of the Celebrated Freezer. Address

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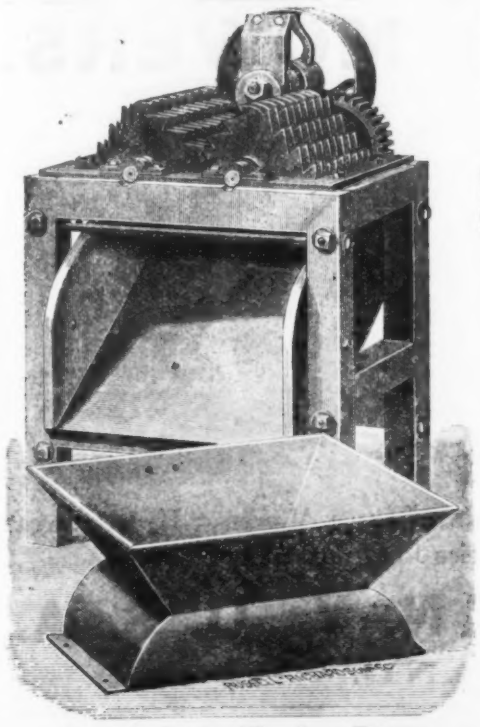

Sands's Large Hand or Power Ice Crusher.

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Sizes, 25 and 44 quarts.

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Are manufactured under a new system—covered by many patents—which produces a result hitherto unequaled.

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Communications or orders for Saws, for Knives, or for Repairing will receive proper attention if addressed to

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TACK & NAIL MACHINERY.

Parties desiring to contract for Tack and Nail Machinery of the **MOST IMPROVED PATTERNS** are invited to correspond with

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Have had **20** years' experience in building all kinds of machinery connected with the business, and **7** years' experience in operating the same; and have a new and complete system for manufacturing Tacks and Nails to impart to parties who wish to engage in the business on an extensive scale.

Chance to Purchase Improved Tack and Nail Machinery.

NELLIS, McINTIRE & CO.
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Manufacturers Nellis' Electric Spring Agitators, For Cultivators, Harrows, Seeders and Smoothing Harrows.
Nellis' Original Harpoon Horse Hay Fork, Nellis' Grapple and Wood Wheel Pulleys, Nellis' Cast Tool Steel Castings, Nellis' Ornamental Fencings, Railings and Crestings, Agricultural Steels of all kinds, Crucible Cast, Iron Centers, and Open Hearth Steels. Post Augers and Diggers, &c.

THE "EDDY" STRAIGHTWAY
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ALSO
FIRE HYDRANTS.
Axe, Hatchet, Powder and Brush Machinery.
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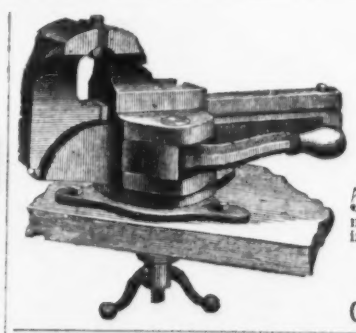
AGENTS IN ALL PRINCIPAL CITIES.
Send for Price List.



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50 PER CENT. of time and labor saved by every mechanic using this solid, quick-working Vise. Strongest and most durable of any Vise in the market. Has the latest improved taper, pipe, and other attachments.

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PHILADELPHIA SMELTING COMPANY, Limited,
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GENUINE BABBITT, Guaranteed at a speed of 10,000 a minute, and at any pressure for 10 years.

Office JAMES BUTTERWORTH & SON, Manufacturers of Woolen Machinery, 262, 264 and 266 E. Adams St.

PHILADELPHIA, October 17, 1881.

PHILADELPHIA SMELTING COMPANY.—GENTLEMEN: We have been running your "Genuine Babbitt" on our wood drilling machine for the last eight years at a speed of 5000 revolutions per minute, without renewal. We have found it to be the best metal we ever used.
Yours truly, JAMES BUTTERWORTH & SON.

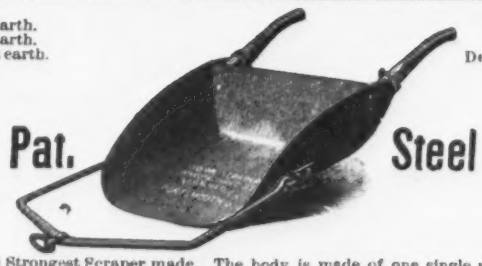
DEOXIDIZED BRONZE,
Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

PHILADELPHIA, October 4, 1879.

PHILADELPHIA SMELTING COMPANY, City.—GENTLEMEN: After a trial of eighteen months of your "Deoxidized Bronze" as journal boxes in our rolling mill, where great pressure is required, we take pleasure in recommending it as being superior to any we have heretofore used.
Very truly, HENRY DISSTON & SONS.

No. 1 Carries 7 feet earth.
No. 2 Carries 5 feet earth.
No. 3 Carries 3½ feet earth.

PATENTED
December 27th, 1881.



The York Pat. Steel Scraper.

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It saves from 15 to 25 per cent. in labor and fuel.

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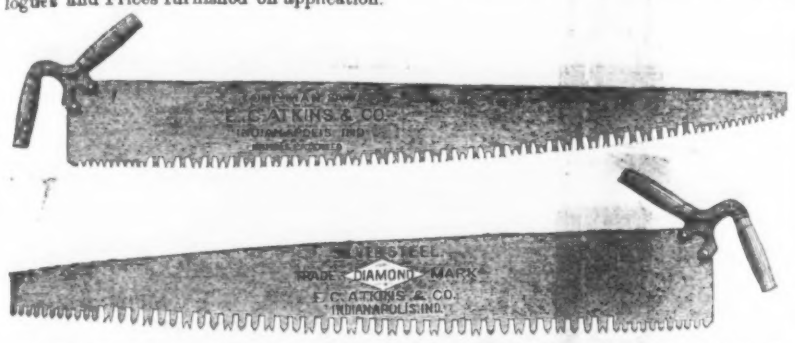

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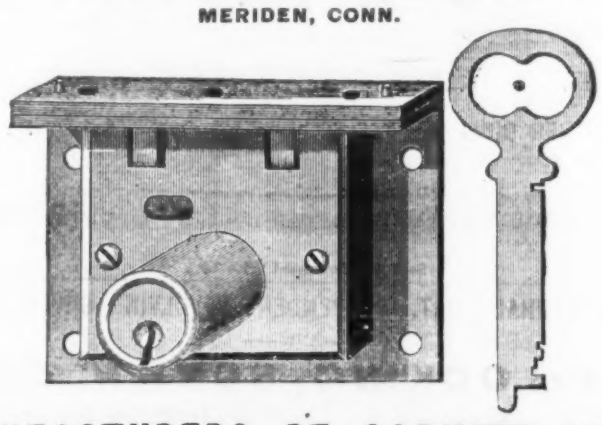

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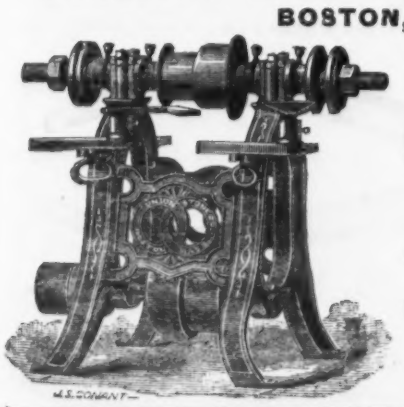

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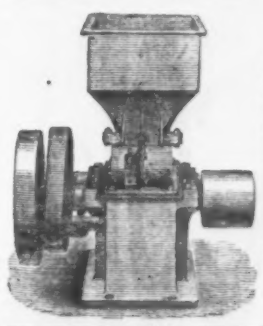

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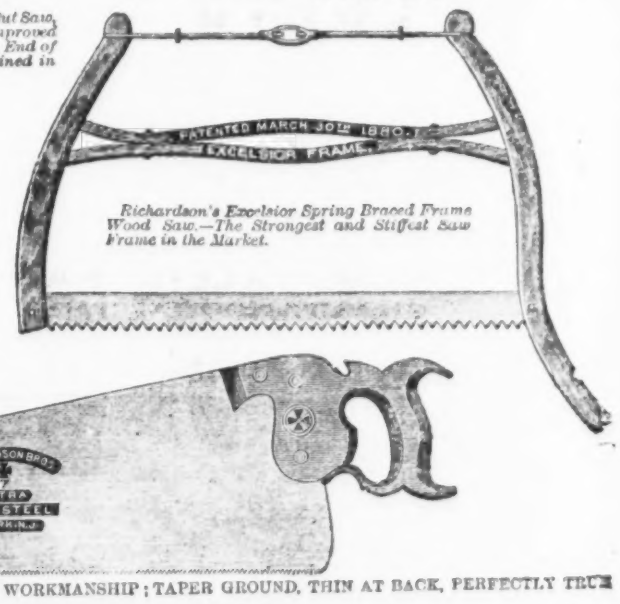

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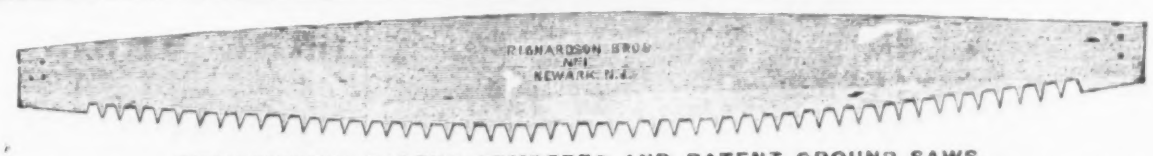

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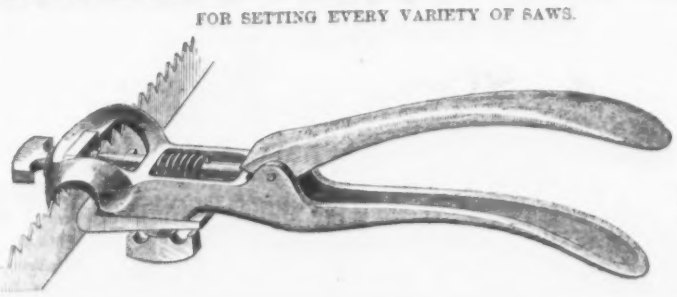

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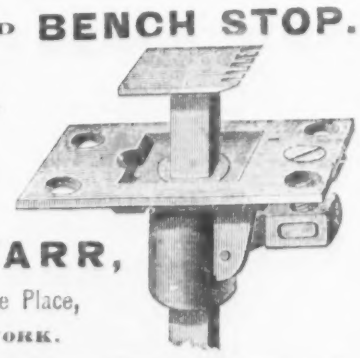

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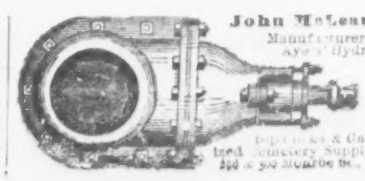

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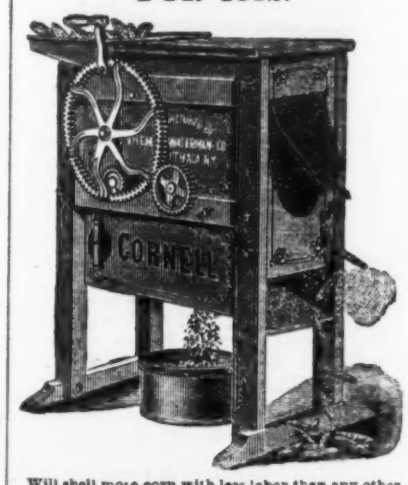

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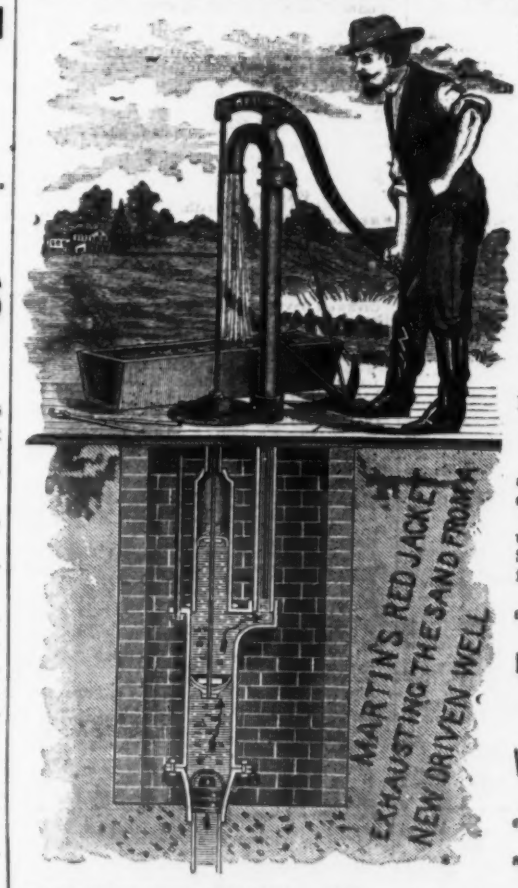

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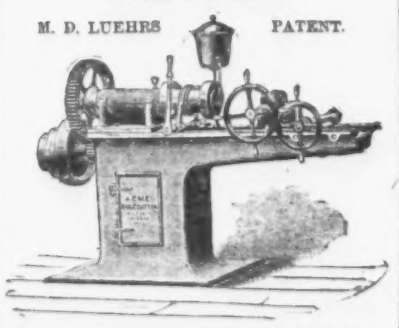

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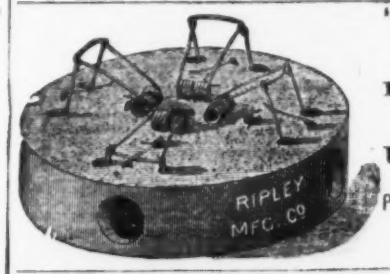

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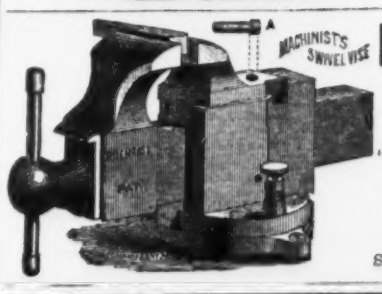

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Augers and Bits.
Conn. Valley Mfg. Co. | Douglass Mfg. Co. | C. E. Jennings & Co. | Humphreysville Mfg. Co. | Ives | Beecher (French, Swift & Co.) | Griswold | Nobles Mfg. Co. | Snell Mfg. — dis 45&10 % from list of Jan. 7, 1880.
Watrous & Co. Extension Lip........dis 35 %
Cook's Douglass Mfg. Co........dis 40&10 %
Patent Solid Head........dis 30 %
Lewis' Patent Single Twist........dis 40 %
Russell Jennings' Auger, Dowel, Machine-Dowel and Hand Rail bits........dis 10&10&10 %
Russell Jennings' Augers........dis 16⅔&10&10&10 %
Russell Jennings' Car and Machine Bits, Boring Machine and Millwrights' Augers........dis 25&10&10&10 %
Imitation Jennings' Bits........dis 50 %
Ives' "Jennings'" Bits........dis 40&10 %
Snell Mfg. Co.'s Jennings' Bits........dis 40 %
Andrews' Bits........dis 40 %
Expansive Bits, Clark's, small, $18; large, $26..dis 25 %
Expansive Bits, Ives'........$20 @ $40—dis 33⅓&10 %
Expansive Bits, Blake's........$20—dis 40 %
Expansive Bits, Derby, $17 and $26........dis 40 %
Hollow Augers, Ives' | Hollow Augers, French, Swift & Co. — dis 25 %
Hollow Augers, Douglass'........25 %
Hollow Augers, Bonney's Adjust. ℘ dz. $48—dis 25&10 %
Hollow Augers, Stearns' Adjust. ℘ dz. $48—dis 20&10 %
Hollow Augers, Ives' Expansive, each $4.50—dis 30&10 %
Hollow Augers, Universal Expan., each $4.50—dis 20 %
Wood's........dis 25 %
Gimlet Bits........$7.50 ℘ gross, dis 50
Gimlet Bits, Diamond........℘ doz. $1.10, dis 25&10 %
Gimlet Bits "Bee"........dis 25 %
Double Cut Gimlet Bits, Shepardson's........dis 40 %
Double Cut Gimlet Bits, Ct. Valley Mfg. Co. dis 30&10 %
Double Cut Gimlet Bits, Hartwell's........dis 60 %
Double Cut Gimlet Bits, Douglass'........dis 40 %
Double Cut Gimlet Bits, Ives'........dis 50 %
Morse's Bit Stock Drill........dis 25 %
Holtz Bit Stock Drills........dis 25&10 %
L'Hommedieu's Ship Augers........dis 15

Awl Hafts.
Sewing, Brass Ferrule........$3.50 ℘ gross—dis 40&10
Patent Sewing, Short........$1.00 ℘ doz.—dis 40&10 %
Patent Sewing, Long........$1.20 ℘ doz.—net
Patent Peg, Plain Top........$10.0 ℘ gross—dis 40&10 %
Patent Peg, Leather Top..$12.00 ℘ gross—dis 40&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common....℘ gross $1.70—dis 25&10 %
Awls, Shouldered Peg........℘ gross $2.45—dis 25&10 %
Awls, Patent Peg........℘ gross 63c—dis 25&10 %
Awls, Shouldered Brad........℘ gross $2.70—dis 25&10 %
Awls, Handled Brad........$7.50 ℘ gross—dis 25&10 %
Awls, Handled Scratch........$7.50 ℘ gross—dis 25&10 %
Awls, Socket Scratch........$1.50 ℘ gross—dis 10&10 %
Brad Sets, Aiken's........℘ doz $12.00—dis 45&10 %
Millers Falls Adj. Tool Hdles........℘ doz $12—dis 25 %
Brad Sets, No. 42, $10.50; No. 43, $12.5..........dis 70 %
Brad Sets, Stanley's Excelsior, No. 1, $9.60..dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 2, $1.80..dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $7.80..dis 30&10 %

Axes.
Single Bit, 4½ to 5½ and under........℘ doz 9.00 net
Single Bit, 4½ to 6 and over........℘ doz $9.50 net
Single Bit, beveled........50c ℘ doz advance
Double Bit, 4½ to 5½ and under........℘ doz $17.00 net
Double Bit, 4½ to 6 and over........℘ doz $18.00 net
Double Bit, beveled........$1.00 ℘ doz advance

Axle Grease.
Frazer's........℘ ℔ 6c

Axles.
Standard list........dis 45 %

Bag Holders.
Sprengle's Patent, ℘ doz $18........dis 40 %

Balances.
Spring Balances........dis 15&10 %

Bells.
Hand, Light Brass........dis 65&10 %
Hand, Extra Heavy........dis 45 %
Hand, White Metal........dis 60 %
Hand, Silver Chime........dis 20&10 %
Hand, Globe (Cone's Patent)........dis 25&10 %
Gong, Abbe's........dis 20&10 %
Gong, Yankee........dis 30&10 %
Gong, Barton's........dis 30&10 %
Crank, Taylor's........dis 25&10 %
Crank, Brooks'........dis 50&10&2 %
Crank, Cone's........dis 10 %
Crank, Connel's........dis 10 %
Lever, Sargent's........dis 55&10 %
Lever, Taylor's Bronzed or Plated........net
Lever, Taylor's Japanned........dis 25&10 %
Lever, R. & E. M. Co.,s........dis 45&10&2 %
Lever, Reading........dis 25&10&10 %
Pull, Brook's........dis 50&10&2 %
Pull, Western........dis 25&10 %
Call........dis 25 %
Cow, Common Wrought........dis 55&10 %
Cow, Western........dis 20&10 %
Cow, Western, Sargent's list........dis 55&10 %
Cow, Kentucky "Star"........dis 20&10 %
Cow, Kentucky Sargent's list........dis 55&10 %
Cow, Dodge's Genuine Kentucky, new list—

Nos.	0	1	1½	2	3	4	5	6	Hog	
	$12.00	10.00	9.00	8.00	7.00	5.00	3.50	2.50	5.00	dis 60 %

Cow, Texas "Star"........dis 40 %

Bellows.
Blacksmiths' Common........dis 45 %
Blacksmiths' Extra Pittsburgh Pattern........dis 20 %
Molders'........dis 25 %
Hand Bellows........dis 20 %

Belting, Rubber.
Belting and Packing Co........dis 50 %

Bit Holders.
Extension, Barber's........℘ doz $15.00—dis 40&5 %
Extension, Ives'........℘ doz $15.00—dis 40 %
Diagonal........℘ doz $24.00—dis 40 %
Angular........℘ doz $24.00—dis 40&5 %

Blind Adjusters.—Domestic..℘ doz $3.00—dis 30 %
Excelsior........℘ doz $16.00—dis 50&10&2 %

Blind Fasteners.
Mackrell's........℘ doz pairs, $1.00 dis 20&10 %
Van Sand's Screw Pattern........$9 ℘ gro. net
Van Sand's Old Pattern... 1¼, $8; 1½, $8.50; ℘ gro. net
Washburn's Old Pattern........$9 ℘ gro. net
Merriman's........new list, net
Salisbury & Austin, No. 2008........$9 per gro. net
Security Gravity........$9 per gross, net

Blind Staples.
Bar bed, ½ in. and larger........℘ ℔ 11c net
Bar bed ⅜ in........℘ ℔ 13c net

Blocks.
Penfield Block Co., I. R. and I. Strap'd... — New List — dis 35 %
Penfield Block Co., W. I. C. bushed — dis 35 %
Penfield Block Co., W. I. all steel roll'r.. — dis 20 %
Penfield Block Co., L. & I Sheaves — dis 35 %
Stanley Rule & Level Co.'s........dis 40&10 %

Bolts.
Cast Iron Barrel Shutter, &c........dis 55&10 %
Cast Iron Chain (Sargent's list)........dis 65&10 %
Ives' Patent Door Bolts........dis 50 %
Wrought Barrel........dis 55&10 %
Wrought Square........dis 55&10 %
Wrought Shutter, all Iron, Stanley's list....dis 50&10 %
Wrought Shutter, Brass Knob, Stanley's list.dis 50&10 %
Wrought Shutter, Sargent's list........dis 55&10 %
Wrought Sunk Flush, Sargent's........dis 75&10 %
Wrought Sunk Flush, Stanley's........dis 40&10 %
Wrought B. K. Flush, Com'n Stanley's......dis 55&2½ %
Carriage and Tire, Common........dis 80@80&10
Carriage and Tire, Philadelphia, new list........dis 65 %
Carriage and Tire, Philadelphia Pattern........dis 70 %
Union Carriage........dis 70 %
R. B. & W. Carriage (old list)........dis 65 %
Tire, Am. Screw Co.'s, Phila........dis 75 %
Tire, "Bay State"........dis 85&5 %
Tire, R. B. & W., new list........dis 70&10 %
Stove—American Screw Co.'s........dis 40 %
Stove, R. B. & W........dis 40 %
Stove, R. & E. Mfg. Co........dis 40 %
Plow........dis 50 %
Plow, R. B. & Co........dis 40 %
Machine........dis 65 %
Bolt Ends........dis 60&10 %

Borax.........16c ℘ ℔ net

Boring Machines. Upright Angular
First quality, no Augers........$5.50 $6.75..dis 45@50 %
Phillips, with Augers........7.00 7.50........net
Jennings & Co., no Augers........5.50 6.75........dis 40 %

Boxes.
Interchangeable Shelf Boxes........dis 20 %

Braces.
Q. S. Backus........dis 50 %
Wilson Mfg. Co........dis 10 %
Barber's........dis 40&5 %
Spofford's Patent........dis 50&5 %
Ives' Patent Braces........dis 50&10 %
Common Ball (American)........dis 55 %
Amidon's........dis 30 %
Barker's Imp'd........dis 10
Empire........dis 30 %
Buffalo Ball........dis 40 %

Brackets.
Shelf, plain........dis 50&10 %
Shelf, fancy........dis 60&10 %
Reading, Plain........dis 55&10 %
Reading, Rosette........dis 60&10 %

Bright Wire Goods list of Dec. 15, '79..dis 55&10 %

Bull Rings.
Union Nut Co........dis 55 %
Sargent's........dis 66⅔&10 %
Hotchkiss' low list........dis 15 %
Humason, Beckley & Co.'s........dis 33⅓&10 %
Peck, Stow & W., Co.'s........dis 33⅓&10 %

Butts.
Wrought Brass........dis 65&10&5 %
Cast Brass, Tiebout's........dis 33⅓ %
Cast Brass, Corbin's Fast Joint........dis 20&10 %
Cast Brass, Loose Joint........dis 10&10 %
Fast Joint, Narrow........dis 45&10 %
Fast Joint, Broad........dis 45&10 %
Loose Joint........dis 55&10 %
Loose Joint, Japanned........dis 55&10 %
Loose Joint, Japanned with Acorns........dis 55&10 %
Parliament Butts........dis 55&10 %
Mayer's Hinges........dis 60&10 %
Loose Pin, no Acorn........dis 50&10 %
Loose Pin, Acorns........dis 50&10 %
Loose Pin, Acorns, Japanned........dis 60&10 %
Loose Pin, Acorns, Japanned, Plated Tips..dis 60&10 %

WROUGHT IRON.

Fast Joint, Narrow........dis 45&10 %
Fast Joint, Lt. Narrow........dis 45&10 %
Fast Joint, Broad........dis 45&10 %
Loose Joint, Broad........dis 50&10 %
Table Butts, Back Flaps, &c........dis 45&10 %
Inside Blind Regular........dis 45&10 %
Inside Blind, Light........dis 45&10 %
Loose Pin, Wrt........dis 50&10 %
Loose Pin, Light........dis 45&10 %
Spring Hinges:
Geer's Spring and Blank Butts........dis 25 %
Sabin Mfg. Co.'s Double Acting........dis 45 %
Union Spiral Spring, Japanned........dis 25 %
Union Spiral Spring, Ornamental........dis 20 %
Union Spring Hinge Co.'s........dis 25 %
American Spring Hinge Co.'s........dis 30 %
Gem Spring Hinges........dis 30 %
Barker's Double Acting........dis 20 %
Union Mfg. Co........dis 25 %
Bommer's........dis 25 %
Buckman's........dis 25 %
Blind Butts, Parker........dis 70 %
Blind Butts, Palmer........dis 45&10 %
Blind Butts, Seymour........dis 70 %
Blind Butts, Shepard's "Double Locking," Nos. 1 & 2........dis 70 %
Shepard's Standard, Nos. 4 and 5........dis 70 %
Blind Butts, Lull & Porter........dis 70&10 %
Blind Butts, Nicholson........dis 45&10 %
Blind Butts, Huffer........dis 60 %
Blind Butts, Clark's, Nos. 1, 3, 5........dis 70 %
Blind Butts, Sargent's, Nos. 1, 3........dis 50&10&10 %
Blind Butts, Sargent's, No. 12........dis 70&10 %
Blind Butts, Reading's Gravity........dis 66⅔&10 %
Clark's Improved Shutter Hinge, Nos 0, 1, 1½, 2, 2½........dis 60&10 %

Bow Pins.
Humason, Beckley & Co.'s........dis 55&5 %
Sargent & Co.'s........$19.70 and $21.40, dis 66⅔&10 %
Hotchkiss........dis 25 %
Peck, Stow & W. Co........dis 30&10 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co........dis 25 %
Bradley's........dis 25 %
Beatty's........dis 25&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36 50

Can Openers.
Messenger's Comet........℘ doz $3.00, dis 25 %
American........℘ gross $7.50, dis 10 %
Duplex........℘ doz 25c, dis 15@20 %
Lyman's........℘ doz $3.75, dis 20 %
No 4, French........℘ doz $2.25, dis 55 %
No. 5, Iron Handle........℘ gross $7.5, dis 10 %
Eureka........℘ doz $2.50, dis 10 %
Sardine Scissors........℘ doz $7.00, dis 55 %
Star........℘ doz $5.00, dis 25 %
Sprague, No. 1, $2.00; No. 2, $2.25; No. 3, $2.50........dis 50&10 %
"Worlds Best" ℘ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $30.00........dis 50 & 10 %
Universal........℘ doz $3.00, dis 35 %
Domestic........℘ doz $2.50, dis 45 %
Champion........℘ doz $2.00, dis 50 %

Caps—Percussion, ℘ 1000.
Hicks & Goldmark's
F. L. Waterproof, 1-10's........50c
E. B. Trimmed Edge, 1-10's........65c
E. B. Ground Tr'md Edge, Central Fire, 1-10's..70c
Pistol Waterproof, extra heavy, 1-10's........$1.10
Musket Caps, 1-10's........80c — dis 10&10
U. M. C., F. C. trimmed........50c
U. M. C., F. L. ground........70c — dis 10&10 %
U. M. C., Cen. fire ground........70c
U. M. C., Double W. Proof........$1.40 — dis 10&5 %
G. D. & S. B........33c, dis 10 %
Double Waterproof, in 1-10's........$1.40
Colt's Pistol, in 1-10's........7.0 — dis 10 %
F. L........50c
E. B. 1-10, trimmed........65c
E. B. 1-10, ground edge........70c — dis 10&5 %
Musket, in 1-10's........80c, dis 10&10 %

Cartridges.—Rim.........dis 70&10 %
Central Fire........dis 20&10 %

Cards.—Horse and Curry new list, July, '81, dis 10 %
Cotton........new list, July, '81, dis 10 %
Wool........new list, July, '81, dis 10 %

Carpet Stretchers.
Cast Steel, Polished........℘ doz $5.00, dis 30 %
Cast Iron, Steel Points........℘ doz $2.00, dis 50&5 %
Socket........℘ doz $2.50, dis 25 %
Bullard's........dis 25 %

Casters.
Bed........dis 40&10 %
Plate........40&10 %
Shallow Socket........dis 35&10 %
Deep Socket........dis 25&10 %
Martin's Patent (Phoenix)........dis 25 %

Cattle Leaders.
Humason, Beckley & Co.'s........dis 60&10 %
Sargent's........dis 70&10 %
Hotchkiss........dis 25 %
Peck, Stow & W. Co........dis 33⅓&10 %

Chain.
Trace, 6½-10-2........℘ pair 70c
Trace, 6½-10-3........℘ pair 70c — dis 35 %
Trace, 7-10-2........℘ pair 80c
German Halter Chain, list of Dec. 31, 1881........dis 50 %
German Coil, list of Dec. 31, 1881........dis 50 %
Covert Halter, Hitching and Breast........dis 35&5 %
Oneida Halter Chain (old list)........dis 45 %
Galvanized Pump Chain........℘ ℔ 9½c net
Jack Chain, Iron........dis 60&10 %
Jack Chain, Brass........dis 50&10 %

Chalk.
White........℘ gross 60c net
Red........℘ gross 80c net
Blue........℘ gross $1.00 net
White Crayons........℘ gross 11c net

Chalk Lines.—See Lines

Chisels.
Socket Framing, Crossman........dis 65&5 %
Socket Framing, Arlington Edge Tool Co...dis 65&10 %
Socket Framing, Buck Bros........1876 list, dis 22½ %
Socket Framing, Merrill........dis 65&10 %
Socket Framing, Witherby Tool Co........dis 65&10 %
Socket Framing, Douglass'........dis 65&10 %
Socket Firmers, Crossman........dis 65&5 %
Socket Firmers, Arlington Edge Tool Co....dis 65&10 %
Socket Firmers, Buck Bros........1876 list, dis 22½ %
Socket Firmers, Merrill........dis 65&10 %
Socket Firmers, Witherby Tool Co........dis 65&10 %
Socket Firmers, Douglass'........dis 65&10 %
Socket Corner........dis 65&10 %
Tanged Firmers........dis 40@45 %
Tanged Firmers, Butcher's........$5.00@$5.25 to £
Tanged Firmers, Spear & Jackson's........5.00 to £
Tanged Firmers, Buck Bros (Shank)........5.25 to £
Globe Mfg. Co........dis 65&10 %

Clamps.
Iron, Providence Tool Co.'s Wrt. Iron........dis 25 %
Iron, Adjustable, Gray's........dis 20 %
Iron, Adjustable, Lambert's........dis 20 %
Iron, Adjustable, Snow's........dis 40&5 %
Iron, Adjustable, Hammer's........dis 15 %
Iron, Adjustable, Stearns'........dis 20&10 %
Iron, Cabinet, Sargent's........dis 70&10 %
Iron, Carriage Makers', Sargent's........dis 65&10 %

Clips, Axle.
Norway or Best........dis 60&5 %
Superior........dis 60&5 %

Coal Hods.
Griffiths'........dis 33⅓ %

Cockeyes.........dis 55 %

Cocks, Brass.
Racking, new list, July 10, 1880 | Globe, new list, July 10, 1880 | Plain Bibbs, new list, July 10, 1880 | Ale and Beer, new list, July 10, 1880 — dis. ...35 %

Coffee Mills.
Board and Box........dis 45 %
Wilson's........dis 45 %
Selsor's Flat........$9.50, $10.50, dis 45 %
American (Enterprise Mfg. Co.)........dis 25 %
The "Swift" (Lane Bros.)........dis 25 %
Webb's Patent........dis 45 %

Combined Dinner Pail and Lantern.
Per doz $15.00........dis 30 %

Compasses, Dividers, &c.
Compasses........dis 55 %
Calipers........dis 55 %
Dividers........dis 55 %
Bemis & Call Co.'s Dividers........dis 60&5 %
Bemis & Call Co.'s Compasses and Callipers..dis 50&5 %
Bemis & Call Co.'s Wing & inside or outside..dis 50&5 %
Bemis & Call Co.'s Double........dis 60 %
Bemis & Call Co.'s (Call's Patent Inside)........dis 30 %
Excelsior........dis 50 %
Miller's Patent........dis 25 %

Coopers' Tools.
Bradley's........dis 10 @ 20 %
Barton's........dis 20 %

Corkscrews.—Humason & Beckly Mfg.Co.dis 33⅓ %
Clough's Pat........dis 33⅓ %

Corn Knives and Cutters.—Bradley's...dis 10 %
Wadsworths........dis 25 %

Crow Bars.
Cast Steel........℘ ℔ 8¼c
Iron, Steel Points........℘ ℔ 6¼c

Curling Irons, &c.
⅜, ⅝, ¾ in., $1.80, 2.00, 2.30........dis 10 %
Curling Tongs........℘ doz $3.65, dis 10 %
Pinching Irons........℘ doz $7.50, dis 20 %

Curry Combs.
Fitch's, new list........dis 50 %
Hotchkiss, Novelty, new list, July, 1880........dis 25 %
Hotchkiss, Excir. Supr. Champion........dis 25 %
Rubber........℘ doz $10.00, dis 25 %

Curtain Pins.
Silvered Glass........net
White Enamel........net

Cutlery.
Meriden Cutlery Co. (Table)........net
Am. Miller Bro.'s Cutlery Co........dis 25 %
Humason & Beckley, Pocket........dis 33⅓ %
Naugatuck Cutlery Co........list net
Aaron Burkinshaw's Pocket........dis 25 %

Dog Collars.
Embossed Gilt........dis 20 %
Leather........dis 50 %
Brass........dis 40 %
Celluloid........dis 40 %

Door Springs.
Torrey's Rod, regular size, ℘ doz., $3........dis 40&10 %
Gray's Rod........dis 15 %
Bee Rod........dis 15 %
Warner's........dis 15&10 %
Gem (Coil):
No. 1, Large Japanned........℘ doz $4.00
No. 2, Medium, Japanned...℘ doz 2.75 — dis 50 & 10 %
No. 3, Small, Japanned........℘ doz 2.00
Star (Coil)—For Cop'd, Nickel-Plated &c., see list.
No. 4 ("Shoo Fly") Screen door size, ℘ doz $1.50
No. 5, Screen Door size........℘ doz 2.00
No. 6, Medium........℘ doz 2.75 — dis 60 %
No. 7, Large........℘ doz 4.00
Sabin's Lever..No. 1, $1; 2, $1.50; 3, $2; 4, $2.50..dis 35 %
Sabin's Boss.No. 1, ℘ doz. $4.00; 2 $2.75; 3, $2.dis 33⅓ %
Sabin's Crown........℘ doz $1.50, dis 33⅓ %
Philadelphia........5 in., $5.00; 8 in., $7.75, dis 35 %
Cowell's........No. 1, ℘ doz. $18.00; No. 2, $15.00, dis 50 %
Rubber, complete........℘ doz. $1.80, dis 10 %
Hercules........dis 40 %

Drawing Knives.
Arlington Edge Tool Co........dis 65&10 %
Crossman's No. 1........dis 65&5 %
Morrill........dis 65&10 %
Nobles Mfg. Co........dis 15 %
Bradley's........dis 35 %
Adjustable Handle........dis 20 %
Witherby Tool Co........dis 65&10 %
Douglass........dis 65&10 %
Globe Mfg. Co........dis 65&10 %

Drills and Drill Stocks.
Blacksmiths'........each, $2.50, dis 10 %
Blacksmiths' Self-Feeding........each, $7.50, dis 20 %
Breast, P. S. & W........dis 20&10 %
Breast, Hotchkiss'........dis 20 %
Breast, Wilson's........dis 20 %
Breast, Millers Falls........each, $3.00, dis 25 %
Breast, Bartholomew's........each, $2.50, dis 25&10 %
Ratchet, Merrill's........dis 10 %
Ratchet, Ingersoll's........dis 25 %
Ratchet, Whitney's........dis 20 %
Ratchet, Weston's........dis 20 %
Ratchet, Moore's Triple Action........dis 20&25 %
Whitney's Hand Drill, Plain, $11.00 Adjustable, $12.00........dis %
Wilson's Drill Stocks........dis 10 %
Automatic Boring Tools........each, $7.25, dis 20 %

Drill Chucks.
Morse's Beach Patent........dis 30 %
Morse's Adjustable........each, $10.00, dis 30 %
Danbury........each, $8.00, dis 30 %

Egg Beaters.
Dover........℘ doz. $2.50, dis 2 %
Monroe's........dis 50 %
National........℘ doz. $4.50, dis 33⅓ %
Standard........℘ gross, $18.00, dis 25 %
Family (T. & S. Mfg. Co.)........℘ gross, $18.00, net
Acme........℘ gross, $12.00, dis 25 %
Triumph (T. & S. Mfg. Co.)........℘ gross, $12.00, net

Elevator Buckets.
Mill E. Buckets, light. 3½ to 10 in. (Due's Improved), ℘ 100, $15.00 @ $54.00........dis 10 %
Mill E. Buckets, heavy 5 to 10 in. (Due's Improved), ℘ doz. $5.60 @ $10.20........dis 10 %
Storehouse (Due's Patent), 12 to 17, $12 @ $20....dis 10 %

Emery and Emery Paper.
Regular numbers........℘ ℔ 6c
Flour and F. F........℘ ℔ 4c
B. & A. Emery Paper........dis 30&5 %
Sibley's Emery and Crocus Cloth, large size, $10; medium, $10.50 ℘ ream........dis 15 %

Enameled and Tinned Ware.
Kettles........dis 50 %
Sauce Pans........dis 25 %
Tinned Sauce Pans........dis 25 %

Escutcheon Pins.
Brass........dis 50 %

Escutcheons.
Door Lock........Same discounts as Door Locks
Brass Thread........dis 55 %
Wood........dis 25 %

Faucets.
Fenn's........dis 40 %
Bohren's Patent Rubber Ball........dis 25 %
Fenn's Cork Stops........dis 33⅓ %
Star........dis 55&10 %
Frary's Patent Petroleum........dis 20&10 %
West's Patent Key........dis 45 %
Anchor Lock........dis 45 %
Metallic Key, Leather Lined........dis 60 %
Cork Lined........dis 70 %
J. Sommer's Best Metallic Key........dis 10 %
J. Sommer's Cork Lined, 1st quality........dis 50 %
Self-Measuring, Enterprise........℘ doz. $30.00, dis 25 %
Self-Measuring, Lane's........℘ doz. 36.00, dis 25 %
Self-Measuring, Victor........℘ doz. 36.00, dis 25 %

Felloe Plates........℘ ℔, 10c, dis 25 %

Files.
Auburn........$5.00 to £, dis 35 %
E. M. Boynton's........new list, dis 30 %
J. & Riley Carr........$4.50 to £
J. & Riley Carr Horse Rasps........$4.75 to £
Johnson & Bro........dis 30 %
Butcher's........$4.50 to £
Walter Spencer & Co.'s "Diamond"........$4.50 to £
Fisher's........$4.75 to £
Moss & Gamble........$4.50 to £
H. Disston & Sons (new list)........dis 40 %
Heller Bros.' Horse Rasps........dis 30 %
Heller Bros.' Files........dis 40 %
Nicholson........dis 40 %
New American........dis 40 %
Union File Co........dis 40 %
Stubs........$7.00 to £

Fluting Machines.
Knox, 4½-inch Rolls........$3.50 each
Knox, 6-inch Rolls........$4.00 each — dis 25
Eagle, 3½ inch Roll........$2.15, dis 25 %
Eagle, 5½-inch Roll........2.85, dis 25 %
Crown, 4½-in., $3.50; 6-in., $4.00; 8-in., $6.50 each, dis 25 %
Crown Jewel........6-in., $3.40 each, dis 25 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 25 %
Domestic Fluter........$1.50 each, net
Geneva Hand Fluter, White Metal...℘ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.00 ℘ doz........dis 25 %
Shepard Hand Fluter, No. 85, $15; No. 95, $6.50; No. 110, $8.75........dis 30 %
Clark's Hand Fluter........℘ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron....℘ doz $15.00, dis 30 %
Buffalo........℘ doz $10.00, dis 10 %

Fluting Scissors........dis 45 %

Fly Traps.
Paragon........℘ doz, $3, net

Forks.
Hay, Manure and Spading........dis 50&10 %
Plated, A 1, Rogers & Bro........dis 40&10&5 %
Plated, Reed & Barton........dis 40&10&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co........dis 25 %

Fry Pans.
Burnished list as follows........dis 65 %

No	0	1	2	3	4	5	6	7	8
℘ doz	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

"Acme"........dis 40&10 %

Gauges.
Marking Stanley's........dis 50&10 %
Marking, Chapin's........dis 55&10 %
Wire........dis 70&10 %
Wire, Disston's........dis 20 %
Wire, Wheeler, Madden & Co........dis 10 %

Gimlets.
Nail and Spike........dis 40&10 %
"Eureka" Gimlets........dis 40&10 %
"Diamond" Gimlets........dis 40&10 %
Double Cut, Shepardson's........dis 40&10 %
Double Cut, Hartwell's........dis 40&10 %
Double Cut, Ives'........dis 40&10 %
Double Cut, Douglass'........dis 40&10 %
"Bee"........℘ gro. $12.00, dis 25 %

Glue Pots.
Tinned and Enameled........dis 25 %
Family, Howe's "Eureka"........dis 25 %
Family, L. F. & C.'s "Handy"........dis 30 %

Grindstone Fixtures.
Sargents Patent........dis 70&10 %
Reading Hardware Co........dis 30&10 %

Gun Wads.
U. M. C. B. E., 11 up........$2.00
U. M. C. B. E., 9&10........2.30
U. M. C. B. E., 7&8........2.60
U. M. C. P. E., 11 up........3.10 — dis 5&5 %
U. M. C. P. E., 9&10........4.00
U. M. C. P. E., 7&8........4.90

Halters.
Covert's Pat. Rope........dis 50 %
Horse and Cattle Ties, Covert's........dis 50 %

Hammers.
Maydole's........dis 15 %
Cheney's........dis 25 %
Hartford Hammer Co. (new list July 1. '81)....dis 20 %
Humason & Beckley........dis 40 %
Verree........dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.26, 1.50 and 1.75..dis 25&10 %
Nelson Tool Works........dis 40&10 %
Warner & Noble's........dis 5 %
Yerkes & Plumb........dis 15 %
Wilkinson's Smiths'........11½c ℘ ℔ net

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ℘ doz..dis 10 %
Providence Tool Co., Leg Irons, $25.00 ℘ doz ...dis 10 %
Tower's........dis 25 %

Handles.—Door or Thumb Latches.

Nos	0	1	2	3	4	
Per doz	$0.80	1.00	1.18	1.35	1.50	dis 65 %

Roggin's Latches........℘ doz 35c. @ 40c. net
Bronze Iron Drop Latches........℘ doz $0.90 @ 1.10
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88........dis 10 %
Barn Door........℘ doz $1.60, dis 10&10 %
Wrought Chest........dis 70 %
Surface Chest........dis 60&10 %
Flush Chest........dis 60&10 %
Lifting........dis 55&10 %
Saw and Plane........dis 40&10 %
Boynton's Loop Saw Handles........50c. dis 35 %
Boynton's Centennial Saw Handles........30c. dis 25 %
Hammer and Hatchet........dis 20 %
Brad Awl........℘ gross, $3.00, dis 20&10 %

Hickory Firmer Chisel, assorted, ℘ gross..$4.50
Hickory Firmer Chisel, large, ℘ gross........5.00
Apple Firmer Chisel, assorted, ℘ gross........5.00
Apple Firmer Chisel, large, ℘ gross........6.00
Socket Firmer Chisel, assorted, ℘ gross........3.00
Socket Framing Chisel, assorted, ℘ gross........5.00
File assorted, ℘ gross........2.75
Auger, assorted, ℘ gross........5.00
Auger, large, ℘ gross........7.00 — dis 20&10 @ 25&10
Patent Auger, Ives'........dis 25 %
Patent Auger, Douglass'........℘ set $1.25 net
Patent Auger, Swan's........℘ set $1.00 net

Hangers.
Barn Door, old pattern........dis 60&10 %
Barn Door, New England........dis 65&10 %
Climax (Anti-Friction)........dis 50 %
Challenge........dis 50 %
"Champion" Medina Mfg. Co........$15; dis 50&10 %
Sterling Improved (Anti Friction)........dis 65&10 %
Cheritree........dis 50 %
Kidder's........dis 50&5 %
U. S........4 in., $12; 5 in., $15; dis 60 %
The "Boss"........dis 50&10 %
Terry's Patent........5 in., $12; 3½ in., $10; dis 40 %

Harness Snaps.
Anchor (T. & S. Mfg. Co.)........dis 60 %
Henshaw's, list of 1½ changed to $14.00........dis 55&10 %
Judd's, list of 1½ changed to $14.00........dis 55&10 %
Fitch's (Bristol), list of 1½ change to $14.00...dis 55&10 %
Hotchkiss'........dis 10 %
Andrews'........dis 50 %
Sargent's........dis 70&10 %
German, low list, Sep., 1882........dis 33⅓ %
German, Sargent's new list........dis 60&10 %
Covert........dis 50 %
Covered Spring, new list, Oct., 1882........dis 60&10 %

Hatchets.
Isaiah Blood........dis 30 %
Shingling, Nos. 1 2 3........℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3........℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3........℘ doz 7.50 8.00 8.50
Hunt's........dis 40 %
Shingling, Nos. 1 2 3........℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3........℘ doz 7.75 8.50 9.25
Lathing, Nos 1 2 3........℘ doz 7.30 8.25 9.00
Hurd's........dis 30 %
Shingling, Nos. 1 2 3........℘ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3........℘ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3........℘ doz 8.00 8.50 9.00
Yerkes & Plumb........dis 25 %
Shingling, Nos. 1 2 2........℘ doz $7.50 $8.00 $8.50
Claw, Nos. 1 2 3........℘ doz 8.25 8.75 9.25
Lathing, Nos. 1 2 3........℘ doz 7.50 8.00 8.50
Simmons'........dis 30 %
Shingling, Nos. 0 1 2 3..℘ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 0 1 2 3..℘ doz 8.50 9.00 9.50
Lathing, Nos. 0 1 2 3..℘ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4..℘ doz 9.00 10.00 12.00 14.00
Broad, Nos. 5 6 7 8..℘ doz 16.00 18.00 20.00 22.00
Collins........dis 10
Shingling, Nos. 1 2 3........℘ doz $6.00 $6.50 $7.00
Claw, Nos. 1 2 3........℘ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3........℘ doz 6.50 6.50 7.00
Peck's Champion Blade........dis 30
Shingling, Nos. 1 2 3........℘ doz $8.00 $8.50 $9.00
Lath, Nos. 1 2 3........℘ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3........℘ doz 9.00 9.50 10.00
Half, Nos. 1 2 3........℘ doz 8.00 8.50 9.00
Ax Pattern, Nos. 1 2 3........℘ doz 10.00 11.00 12.00

Hay Knives.
"Lightning"........℘ doz $20.00 dis 10 %
Wadsworth's........dis 33⅓ %

Hinges.
Gate, Western........℘ doz $4.90 dis 55 %
Gate, N. E........℘ doz $7.70, dis 55 %
Gate, N. E. Reversible........℘ doz $6.45, dis 55 %
Gate, Clark's, Nos. 1 2 3........dis 50 %
Gate, N. Y. State........℘ doz $5.05, dis 45&10 %
Gate, Automatic........℘ doz $12.50, dis 40 %
Gate, Common Sense........℘ doz pair $4.50, dis 50 %
Gate, Seymour's........dis 45&10 %
Gate, Shepard's........Nos. 1, 2, 3, 10, 20 & 25, dis 50&10 %
Rolled Blind Hinges........dis 60&10 %
Rolled Plate........dis 60&10 %
Rolled Raised........dis 60&10 %
Plate Hinges { 8, 10 & 12 in., $6.25 ℘ 100 ℔ } "Providence" { over 12 in., $5.25 ℘ 100 ℔ } ..dis 10 %
Screw Hook and { 8, 10, 12 in., $7.00 ℘ 100 ℔ } Strap { 14 to 36 in. $5.75 ℘ 100 ℔ } ..dis 10 %
Heavy Welded Hook { 8 to 12 in., $7.00 ℘ 100 ℔ } { 14 in & up, $5.50 ℘ 100 ℔ } dis 10 %
Screw Hook and Eye........⅝ & 1 in., 9c; ¾ in., 9c; ⅝ in., 10c; ½ in., 12c — dis 20 %
Wrought Strap and T........dis 40&10&10&10 %

Hoes.
Riveted Shank........℘ doz $5.00, dis 50 %
Socket........℘ doz $5.25, dis 50 %
Grub........dis 15 %
Planters'........dis 50 %
Scovill Pattern........dis 45 %
Scovill Pattern, Handled........dis 25 %
Hick's Pat Solid C. S. Planters'........dis 20&25 &30 %
Hick's Pat Solid C. S. Scovill Pattern....dis 20&5&35 %
Winsted & Lane, Planters'........dis 25 %
Winsted & Lane, Scovill Pattern........dis 20&25 %
Magic........℘ doz $5 net

Hooks.
Bird Cage, Sargent's list........dis 60&10 %
Bird Cage, Reading........dis 40&10 %
Cotton........℘ doz $4.0, dis 40 %
Cotton Patented (N. Y. Mallet & Handle W'ks), dis 30 %
Cotton (Humason & Beckley Mfg. Co)........dis 40 %
Belt........dis 60&10
Bench—Hotchkiss' $5.00 ℘ doz........dis 10 %
Weston's, No. 1, $10.00; No. 2, $9.00 ℘ doz........dis 25 %
McGill's, $3.00 ℘ doz........dis 10 %
Clothes Line, Sargent's list........dis 65&10 %
Clothes line, Reading list........dis 45&5&10 %
Ceiling, Sargent's list........dis 60&10&10 %
Harness, Reading list........dis 40&10&10 %
Coat and Hat, Sargent's list........dis 60&10 %
Coat and Hat, Reading........dis 40&10&10 %
Picture Hooks, Brown's Pat. Solid Brass, $4.00 ℘ gross........dis 25 %
Tassel and Picture (T. & S. Mfg. Co.)........dis 50 %
Wrought Staples and Hooks & Staples..dis 70&7½&10 %
Wrought Staples, Stanley's list........dis 70&7½&10 %
Wire Screw Hooks and Eyes........dis 55&10 %
Grass and Bush........dis 45@50 %
Whiffletree—Patent........dis 35 %
Hooks and Eyes—Malleable Iron........dis 60&10 %
Hooks and Eyes—Brass........dis 60&10 %

Horse Nails.

	Nos. 5	6	7	8	9	10	
Ausable, ℘ ℔	31c	28c	26c	25c	24c	23c	dis 33⅓ %
Clinton, Plain, ℘ ℔	23c	21c	20c	19c	18c		dis 33⅓ %
Clinton, Fin., ℘ ℔	24c	22c	21c	20c	19c		dis 33⅓ %
Essex, ℘ ℔	31c	28c	26c	25c	24c	23c	dis 30&10 %
Putnam "	27c	24c	22c	21c	20c	19c	dis 5&7 %
Vulcan, "	26c	23c	21c	20c	19c	18c	dis 12½ %
Globe, "	24c	21c	19c	18c	17c	16c	dis 12½ %
A. C., "	26c	23c	21c	20c	19c	18c	dis 10&10 %
Ch'mpl'n Forged "	31c	28c	26c	25c	24c	23c	dis 30 %

Horse Shoes.
Burden........℘ keg $4.87½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy........℘ keg $4.87½
Walker's Forged, Light, Med. or Heavy .℘ keg $4.87½
Mule Shoes........℘ keg $5.87½
Dunning's Steel........℘ keg $9.25

Ice Awls, Chisels, &c.
American Ice Chisel........℘ doz $3.00 net
National Ice Chisel........℘ doz $6.25 dis 20 %
Novelty Ice Breakers........℘ doz. $0.25 dis 20 %
White's Sliding Head Picks........℘ doz $2.50 dis 40 %
Dunlap's Ring Picks........℘ doz $2.00 dis 20 %
Wood Head Picks, Sargent's........℘ doz $1.60 dis 50&10 %
Iron Head Picks, Sargent's........℘ doz $1.25 dis 50&10 %
Ice Mallets, Pick in head........℘ doz $1.75 dis 15 %
Ice Mallets, Pick in Handle........℘ doz $2.00 dis 15 %
Ice Axes, Small Cast or Malleable..℘ doz $1.20 dis 10 %
Combination Ice Tools........℘ doz $2.00 net

Ice Cream Freezers.
Amn. Mch. Co........dis 40 %

Ice Creepers.
Safety Reversible........℘ gross $25
Arctic Solid........℘ gross $30 — dis 10 %

Ice Tongs.
Champion........℘ doz $6.00 dis 20&10 %
Family........℘ doz $2.75 dis 15 %

Kettles.
Brass, 7 to 13 inches inclusive........℘ ℔ 28c net
Brass larger than 13 inches........℘ ℔ 32c net

Knives.
Ames' Butcher Knives........dis 25 %
Ames' Shoe Knives........dis 15 %
Ames' Bread Knives........℘ doz $1.50 dis 15 %
Moran's Shoe and Bread Knives........dis 20 %
Hay and Straw, Wadsworth's........dis 33⅓
Table and Pocket........See Cutlery

Knobs.
Carriage (Jap'd 80c ℘ gross)........dis 60&10 %
Base—Common........dis 50&10 %
Hemacite Door Knobs........new list, dis 35&5 %
Door Mineral | Door Por. Jap'd | Door Por. Plated | Door Por. — Same discounts as Door Locks.
Furniture Plain........75c gross inch, dis 10 %
Furniture, Wood Screws........dis 20 %
Picture, Judd's........dis 60&10&10 %
Picture, Sargent's........dis 60&10 %
Hemacite, Picture........dis 35 %
Shutter, Porcelain........dis 60&10 %

Ladles.
Melting, Sargent's........dis 50&10 %
Melting, Reading........dis 30&10 %
Melting, Monroe's Patent........℘ doz $4.00 dis 40 %
Melting, P. S. & W........dis 30&10 %

Lanterns.
Tubular........No. 0, $8.65; No. 1, $10.15 With Guards 35c extra — net
Nail City........No. 1 ℘ doz $10; No. 2, $9, net
Meteor........No. 1, ℘ doz, $9.50; No. 2 $8.5, net
Hurricane, No. 2........℘ doz $5.75, net
Peerless, No. 5........℘ doz $11.75, dis 10&10 %
Brady's Patent........dis 10&10 %
Ætna........dis 10&20 %
Yankee........dis 10&10 %
De Beque........dis 10&10 %
Police Small, $6.25; Med., $7.50; Large, $12.00, dis 10 %
Convex Reflector........$2.75 ℘ doz, dis 15 %

Lemon Squeezers.
Porcelain Lined........℘ doz $6.00, dis 30 %
Wood........℘ doz 3.00, dis 30 %
Eureka, Tinned........℘ doz 8.00, dis 10 %
Dunlap's Improved........℘ doz 3.75, dis 20 %
Sammis'...No. 1, $6; 2, $8.40; 12, $15 ℘ doz dis 25&10 %

Townsend's Patent........$6.00 ℘ doz, dis 33⅓ %
Jennings "Star"........$2.00 ℘ doz net
The "Boss"........℘ doz $4.00, dis 10&10 %
Dean's, Nos. 1, ℘ doz, $15.00; 2, $9.00; 3, $5.60....dis 40 %

Lines.—Linen Fish........dis 25&10 %
Cotton Chalk........dis 55 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.70; No. 2, $7.00; No. 3, $7.50 ℘ gross........dis 20 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50........net
Masons' Colored Cotton........dis 45 %
Wire Clothes, Galvanized........each 25c@40c net

Locks and Latches.
Cabinet, Eagle | Cabinet, Gaylord | Cabinet, Bridgeport — Changes made in list price of some numbers Jan. 1, 1881, dis 25&2 %
Cabinet, P. & F. Corbin........dis 25&2 %
Cabinet, A. E. Deitz........dis 30 40 %
Cabinet, Stoddard Lock Co........dis 40&5 %
Trunk, new list, Jan. 1, 1881........dis 15&2 %
Langstroth & Crane's List, Jan. 1, '77:
Round Key, Nos. 1 to 5........dis 40&10 %
Round Key, Nos. 5½ to 12........dis 40&10 %
Flat Key........dis 33⅓&10 %
A. E. Deitz, Flat Key........dis 30@40 %
Yale Lock Co., Flat Key........dis 40 %
"Shepardson" or "U. S."........dis 35 %
"Felter" or "American"........dis 33⅓ %
Plate........dis 33⅓&2 %
F. Many's "Extension Cylinder"........$10.50 ℘ doz net

DOOR LOCKS, ETC.

Branford | Norwalk | Norwich | P. & F. Corbin | Russell & Erwin | Mallory, Wheeler & Co. | Whipple Mfg. Co. | Trenton Lock Co. — List prices as revised March 8, 1882, with changes of Dec. 13, dis 45&2 %
Reading Hardware Co. (low list)........dis 40&2 %
Padlocks—Russell & Erwin | Mallory, Wheeler & Co. | Norwich Lock Mfg. Co. | Wm. Wilcox & Co. — dis 30 % and 2 % for cash
Yale Lock Mfg. Co.'s "Standard"........dis 40 %
Romer's........dis 25 @ 40 %
Conestoga........dis 60 %
Scandinavian (Moore Bros.)........dis 80 %
J. H. McWilliams........dis 10 %
A. E. Dietz........dis 35 %
"Star"........dis 35 %

Lustro.—4-oz. bottles, ℘ doz $2.00; ℘ gros $18.00 net

Mallets.—Hickory........dis 10&10 %
Lignumvitæ........dis 10&10 %
Penfield Block Co., Lignumvitæ & Hickory ..dis 30 %

Meat Cutters.
Dixon's (P.S.&W.) Nos. 1 2 3 4 ℘ doz..$14.00 17.00 19.00 30.00—dis 25&5 %
Miles' Challenge........Nos. 1 2 3 ℘ doz..$22.00 30.00 40.00—dis 35 %
Perry's. Nos. 1 2 3 4 4 g'rd 5 g'rd Each...$3.00 4.00 5.00 11.00 13.00 36.00—dis 25&5 %
Woodruffs (P. S. & W.)........Nos. 100 150 ℘ doz..$15.00 18.00—dis 25&5 %
Hales'........Nos. 11 12 13 ℘ doz..$27.00 35.00 45.00—dis 50&10&2 %
Draw Cut..Nos. 5 2 6 8 10 Each..$50.00 75.00 80.00 225.00 400.00—dis 20 %
American........dis 25 %
Nos. 1 2 3 4 B 5 Each...$5.00 7.00 10.00 25.00 50.00 60.00
Kieser's No. 55........$40 ℘ doz dis 40 %
Kieser's Gem........$25 ℘ doz, dis 40 %
Kieser's Monarch........$45 ℘ doz, dis 40 %
Kieser's Butcher........$40 each, dis 20 %
Silver & Deming........dis 25 %
Pennsylvania........dis 40&10 %
Nos. 1 2 3 00 ℘ doz $24.00 28.00 36.00 28.00
Beef Shavers (Enterprise Mfg. Co.)........dis 25 %

Mincing Knives.
Am. (2d quality), ℘ gross, 1 blade, $7 2 blades, $12 3 blades, $18........net
Lothrop's........dis 20&10 %
Smith's, ℘ doz, Single, $2.25; Double, $3...dis 33⅓&10 %
Cowles Hdw. Co........dis 40&10 %

Molasses Gates.
Stebbins Patterns........dis 70&10 %
Stebbins Genuine........dis 67½&10 %
Stebbins Tinned Ends........dis 40&10 %
Chase's Hard Metal........dis 50&10 %
Bush's........dis 20 %
Lincoln's Pattern........dis 60&10 %
Weed's........dis 15 %
Boss Nos. 1 2 $7.00 8.00 9.00 10.00....℘ doz, dis 60&10 %

Nails.........See Trade Report
Nuts and Washers.—In lots less than 100 ℔ add ½c to list; 1 lb. boxes, add 1c to list.)
Square Nuts........8 c off list
Hexagon Nuts........8½c off list
Washers........7½c off list

Nut Crackers.
Table (Humason & Beckley Mfg. Co.)........dis 33⅓ %
Blake's Pattern........℘ doz $2.00, dis 5 %
Turner & Seymour Mfg. Co........dis 50 %

Oakum.—is on 100 bales and over ⅛ % ℘ ℔.
Best........℘ ℔ 9 c
U. S. Navy........℘ ℔ 8 c
Navy........℘ ℔ 6¾c

Oilers.—Zinc and Tin........dis 60 %
Brass and Copper........dis 50 %
Malleable (Hammer's)........℘ doz. $5.00, dis 10 %
Prior's Patent or "Paragon" Zinc........dis 60 %
Prior's Patent or "Paragon" Brass........dis 50 %
Olmstead's, Tin and Zinc........dis 60 %
Olmstead's, Brass and Copper........dis 50 %
Broughton's, Zinc........dis 50&10 %
Broughton's, Brass........dis 50 %

Packing, Steam.
N. Y. Belting and Packing Co........dis 20 %

Pencils.
Faber's Carpenters'........high list, dis 50 %
Faber's Round Gilt........℘ gross $5.25, net
Dixon's Lead........℘ gross $4.50, net
Dixon's Lumber........℘ gross $6.75, net
Dixon's Carpenters'........dis 40&10 %

Picture Nails.
Brass Head, Sargent's list........dis 60&10 %
Brass Head, T. & S. Mfg. Co........dis 50 %
Porcelain Head, Sargent's list........dis 60&10 %
Porcelain Head, Judd's list........dis 40@40&10 %
Porcelain Head, T. & S. Mfg. Co........dis 40 %
Niles' Patent........dis 40 %

Pinking Irons.........℘ doz 75c, net

Plaiting Machines.
Magic........℘ doz $10.00, net
Astor Plaiting Machine........each $15.00, dis 20 %
Crown Plaiting Machines........dis 25 %
6 in., $6.00; 10 in., $8.00 each.

Planes and Plane Irons.
Bench, First Quality........dis 20 %
Bench, Second Quality........dis 25 %
Molding........dis 15 %
Bailey's (Stanley R. & L.Co.) new list, Jan.'79.dis 20&10 %
The Stanley (S. R. & L. Co.) new list, Jan.'79..dis 20&10 %
Bailey's "Victor"........dis 20&10 %
Defiance Adjustable........dis 20&10 %
Laflin Mfg Co........dis 35 %
Plane Irons, Butcher's........$5.00 @ $5.25 to £
Plane Irons, Buck Bros........$5.00 to £
Plane Irons, Auburn Tool Co........dis 20 %
Plane Irons, The Globe Mfg. Co., "Baldwin Iron"........dis 20 %
Plane Iron, Ohio Tool Co........dis 20 %
Plane Irons, Sandusky Tool Co........dis 20 %

Pliers and Nippers.
Button's Patent........dis 33⅓ %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $3.50; No. 4, 7 in., $21.00 ℘ doz........dis 25 %
Humason & Beckley Mfg. Co........dis 33⅓ %
Gas Pliers........dis 50 %
Eureka Pliers and Nippers........dis 40 %
Russell's Parallel........dis 25 %
P. S. & W. Cast Steel........dis 33⅓&10 %
P. S. & W. Tinners' Cutting Nippers....add 6 %, dis 10 %

Plumbs and Levels.
Disston's........dis 40 %
Stanley R. & L. Co.'s Pat. Adjustable........dis 65&10 %
Stanley R. & L. Co.'s Non-Adjustable........dis 65&10 %
Chapin's Patent Adjustable........dis 65&10&10 %
Chapin's Non-Adjustable........dis 65&10&10 %
Standard Rule Co.'s New Adjustable........dis 65&10 %
Standard Rule Co.'s Non-Adjustable........dis 65&10 %
Johnson's Patent Adjustable........dis 65&10 %
Pocket Levels........dis 65&10 %
Davis' Inclinometers........dis 20 %

Post Hole and Tree Augers.
Samson Post Hole Digger........℘ doz $37.50, dis 20 %
Fletcher Post Hole Augers........℘ doz $30.00, dis 20 %
Vaughan's Post Hole—6 in., $23.60; 7, 8 and 9 in., $25.00 ℘ doz ....dis 20&10 %
Eureka Diggers ℘ doz $27.00........net
Leed's each $2.50........net

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ℘ doz $19.00, dis 20 %
Disston's Pruning Hook........℘ doz $12.50, dis 20 %
E. S. Lee & Co.'s Pruner........dis 33⅓ %
Pruning Shears........℘ doz $5.50 @ 6.00
Wheeler, M. & Co.'s Combination........℘ doz $12, dis 20 %
Dunlap's Saw and Chisel........℘ doz $5.00, dis 10 %

Pulleys.
Hot House and Tackle........dis 65&10 %
Jap'd Screw........dis 65&10 %
Brass Screw........dis 70&10 %
Jap'd Side........dis 65&10 %
Jap'd Clothes Line........dis 60&10 %
Hay Fork, Solid Eye....$4.50; Swivel, $5.00, dis 50&10 %
Hay Fork, "Anti Friction"........$6.75, dis 10&10 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron........dis 20 %
Shade Rack........dis 45 %

Punches.
Belt or Drive........℘ doz $2.00; 2.25 2.50, dis 50 %
Bemis & Call Co.'s Cast Steel Drive........dis 50&5 %
Bemis & Call Co.'s Springfield Socket........dis 50&5 %
Spring........℘ doz $7.00, dis 50&7½ %
Spring, Leach's Patent........dis 15 %
Bemis & Call Co.'s Spring and Check........dis 40 %
Solid, Tinners'........℘ doz $1.34, dis 40 %

Rail.
Sliding, Door, Wrought Brass....℘ ℔ 43c, dis 50 %
Sliding Door, Bronzed Wrt. Iron....℘ foot 13c, dis 35 %
Sliding Door, Iron, Painted........℘ foot 4c, dis 10&10 %
Barn Door....Inc's ½ ⅝ ⅞ Per 100 feet $2.60 3.60 5.60—dis 10 %
B. D. for N. E. Hangers— Small. Med. Large.
Per 100 feet........$2.10 2.70 .30—net
Terry's Wrought Iron, 50c ℘ foot........net

Razors.
J. R. Torrey Razor Co........dis 15 %

Razor Strops.
Genuine Emerson.....dis 50 %
Badger's Emerson.....dis 50
Badger's (not Emerson).....dis 33⅓ %
Imitation Emerson.....₱ doz $2.00, dis 20 %
Hunt's.....dis 30&5 %
Chapman.....dis 15 to 20 %
Saunder's.....dis 10 %
Torrey's.....dis 20 %

Rivets.
Iron and Tinned, new list, Dec. 10, 1881.....dis 40 %
In bulk, new list, Dec. 10, 1881.....dis 40 %
Copper Rivets and Burrs.....dis 50 %

Nos..	7	8	9	10	11	12	13	14	15
₱ lb..	49c	50c	52c	54c	56c	58c	60c	65c	70c

River Sets......dis 33⅓&10 %

Rods.
Stair, Brass.....dis 25 %
Stair, Black Walnut.....60c. ₱ doz. dis 10 %
Stair, American Patent.....dis 20 %

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 50 %

Rope.
Mnfs' List, Jan. 31, 1883.....use 1c ₱ lb
Manila.....½ inch and larger ₱ lb 16½c
Manila.....⅜ inch ₱ lb 17 c
Manila.....¼ and 5-16 inch ₱ lb 17½c
Manila, Tar'd Rope.....₱ lb 16 c
Manila, Tar'd Lath Yarn.....₱ lb 17 c
Manila, Hay Rope.....₱ lb 16½c
Sisal.....½ inch and larger ₱ lb 12 c
Sisal.....⅜ inch ₱ lb 12½c
Sisal.....¼ and 5-16 inch ₱ lb 12 c
Sisal, Hay Rope.....₱ lb 11 c

Rules.

	Boxwood.	Ivory.
Chapin's, Standard, Stanley, Stephens	dis 70&10 %	dis 55&10 %

Sad Irons.
From 4 to 10.....₱ lb 3½c net
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tallow'.....₱ doz $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons, Doubled Pointed.....dis 35 %
Mrs. Pott's Irons, Square Back.....dis 35 %
Enterprise Star Irons, new list, July 20, 1882...dis 35 %
Combined Fluter and Sad Iron....₱ doz $15.00, dis 15 %
Chinese Laundry (N. E. Butt Co.).....8½c, dis 15 %
New England.....4c, dis 15 %

Sand Paper.
Baeder & Adamson's Flint, 00 to 1½...$4.75 ₱ ream
Baeder & Adamson's Flint, 2, 2½ & 3...5.25 ₱ ream
Baeder & Adamson's Flint, Assorted...4.75 ₱ ream
Baeder & Adamson's Star...5.75 ₱ ream
Baeder & Adamson's Emery...₱ ream $6.50 @ 11.50
(dis 35 & 30&5 %)
Bartles Flint...$4.75&$5.25 ₱ ream dis 35 %
Bartles Harrison, $4.75 ₱ ream.....dis 35 %
New England, same list as B. & A. Flint.....dis 30 %
Gage's.....dis 30&5 %

Sash Cord.
Common.....₱ lb 16c net
Patent.....₱ lb 17c @ 18c net
Silver Lake, Hemp.....₱ lb 9c, dis 10 %
Silver Lake, White Cotton.....₱ lb 9c, dis 10 %
Silver Lake, Drab Cotton.....₱ lb 8c, dis 10 %
Raw Hide, ₱ foot, ¾ in., 8c.; 5-16 in., 7c.; ⅝ in., 10c.
.....dis 15 %
Steel Ribbon.....dis 10 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Walker's.....net
Hammond's Window Springs.....dis 25 %
Northrup Window Springs, No. 1, $10.00 ₱ 12 doz...dis 15 %
The Perfect, Clark & Smith, Plain Jap. ₱ gro. $10.00 net
The Perfect, Clark & Smith, Por. K'b Jap. ₱ gro. $14 net
The Perfect, Clark & Smith, N-Plated...₱ gro. $27.00 net
"Universal".....dis 30 %

Sash Weights.
Solid Eyes, in 400 ₱ lots and over.....₱ lb 1¾cnet

Sausage Stuffers or Fillers.
Miles.....₱ doz $20 dis 25&5 %
Perry.....₱ doz., No. 12; No. 0, $21, dis 25&5 %
Draw Cut No. 1.....each $30.00, dis. 20 %
Enterprise Mfg. Co.....dis 25 %
Silver's.....dis 25 %

Saws.
Disston's Circular, Mill and Cross Cut.....dis 40 %
Disston's Hand, Panel, Rip, &c.....dis 20 %
Boynton's Lightning Cross Cuts, new list.....dis 40 %
Boynton's Circular and Mill.....dis 40 %
Boynton's Ice.....dis 25 %
Boynton's Lightning Hand, Panel and Rip.....dis 25 %
Wheeler & Clemson Mfg. Co.'s Hand.....dis 30 %
W. M. & C. Mfg. Co. Cross Cuts.....dis 30 %
Livingston's Butcher and Kitchen.....dis 20 %
Livingston's Framed Wood—

Nos	101	102	103	104	105
Per doz....	$10.00	8.50	10.00	7.50	5.20 net

Peace Circular and Mill.....dis 40 %
Peace Hand, Panel and Rip.....dis 25 %
Peace Cross Cuts.....dis 35 %
Peace Band Saws, all widths.....dis 10 %
Richardson's Circular.....dis 40 %
Richardson's Mill and X Cut.....dis 40 %
Richardson's Hand Panel, Butcher and Web Saws.....dis 25 %

Saw Frames.
White, Vermont.....₱ doz $1.90. dis 25&10%
Red, Polished and Varnished.....₱ doz $1.50, dis 10%
Saw Rods.....$10 list, dis10 & 10%

Saw Sets.
Boynton's Patent X Cut, per doz, $12.00; Hand Saw per doz, $10.00.....dis 25 %
St Ilman's Genuine.....₱ doz $3.50 and $5.50 dis 10 %
Stillman's Imitation.....₱ doz $3.25, dis 30&10 %
Common Lever.....₱ doz $2.00, dis 30&10 %
Leach's.....No 0, $6.00; No. 1, $15.00, dis 15 %
Nash's.....dis 20&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent.....dis 30&5 %
Bemis & Call Co.'s Lever & Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50 %
Hart's Patent Lever.....dis 20 %
Disston's.....dis 20 %
Morrill's.....No. 1, $15; No. 4, $12, dis 35&10 %

Scales.
Hatch, Counter, No. 171.....₱ doz $42, dis 37½&10 %
Hatch, Tea, No 161.....₱ doz $12.00, dis 37½&10 %
Union Platform.....$6.00, dis 45 %
Fairbanks'.....dis 20 %
Richié Bros.....dis 20 & 10 %
Buffalo Scale Co.....dis 20&5 %
Forsyth Scale Co.....dis 25 %
Howe's.....dis 20&10 %
Chatillon's Grocers'.....dis 40 %
Chatillon's Eureka.....dis 25 %
Family Universal.....dis 50 %
Family Favorite.....dis 30 %
Family, Turnbull's.....dis 30 %
Scale Beams, List of January 12, 1882.....dis 33⅓&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.).....$6.50, dis 20&10%
Box 1 Handle.....₱ doz $4.00, dis 10 %
Box 2 Handle.....₱ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 25&10 %
Ship, common.....₱ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screw Corners.
Porter's Pat Window and Door Frame.....dis 33⅓

Screw Drivers.
Douglas Mfg. Co.....dis 20&10&10 %
Disston's.....dis 40 %
Disston's Patent Excelsior.....dis 40 %
Buck Bros.....dis 25 %
Stanley Rule & Level Co.'s, Varnished Hdls..dis 60&10 %
Stanley Rule & Level Co.'s, Black Handles..dis 50&10 %
Sargent & Co.'s.....dis 50&10 %
Gay's Double Action Ratchet
₱ doz, 4 in., $5.00; 5 in., $10.20; 6 in., $12.00—dis 35 %
Mallett & Co.'s Double Action Clutch
₱ doz, 4 in., $7.40; 5 in., $8.60; 6 in., $9.00—dis 15 %
Champion.....dis 25 %
Clark's Patent.....dis 25 %

Screws.
Flat H'd Iron, new list, Dec 27, 1882.....dis 50&10 %
Round Head Iron, new list, Dec. 27, 1882....dis 45&10 %
Flat Head Brass, new list, Dec. 27, 1882.....dis 50&10 %
Round Head Brass, new list, Dec. 27, 1882...dis 40&10 %
Brass and Silver Capped.....dis 40 %
Japanned, list of Plain Screws.....dis 40&10 %
Quick, Patent Gimlet Point, 65&10 %, by the keg, dis 70 %
Coach, Common or Lag.....dis 60&5&10 %
Bed.....dis 10 %
Machine, Flat Head, Iron.....dis 55 %
Machine, Round Head, Iron.....dis 50 %
Bench, Iron.....dis 55&10 %
Bench, Wood, Beech.....₱ doz $3.00, dis 10 %
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 20&10 %
Hand Rail, Sargent's.....dis 60&5&10 %
Hand Rail, Hunnason, Beckley & Co.'s.....dis 30&10 %
Hand Rail, Am. Screw Co., list of Jan. 1, '81.....dis 70 %
Jack (Willson's).....dis 25 %

Screw Window Balances.
R. B. Huguniu's, No. 1, $2.10; No. 2, $1.75; No. 3 $1.60.....₱ doz net

Scroll Saws.
Lester, $10.00.....dis 25 %
Rogers, $5.50.....dis 25 %

Shears and Scissors.
American (Cast) Iron.....dis 30 %
Pruning.....see Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....₱ doz $3.75
Tinners'.....add 6 %, dis 10 %
Seymour's, List, Dec., 1881.....dis 50 %
Heinsoh's, List, Dec., 1881.....dis 50 %
Heinsch's Tailor's Shears.....dis 33⅓ %
Mass. Cutlery Co, St. Trimmers.....dis 70 %
Wiss, J., & Sons' list, Dec., 1881.....dis 60 %

Sheaves.
Sliding Door, M. W. & Co., list.....dis 40&2 %
Sliding Door, R. & E. list.....dis 50&10&2 %
Sliding Door, Patent Roller.....dis 50&10&2 %
Sliding Door, Patent Roller, Hatfield's.....dis 50&10&2 %
Sliding Door, Russell's Anti-Friction.....dis 50&10&2 %
Sliding Door, Moore's Anti-Friction.....dis 45 %
Sliding Shutter, R. & E. list.....dis 50&10&2 %
Sliding Shutter, Sargent's list.....dis 50&10 %
Sliding Shutter, Reading list.....dis 50&10 %
Moore's Anti-Friction (Hanging).....dis 45 %

Shovels and Spades.
Ames, New list, July 1, 1881.....dis 15 %
Griffiths.....dis 50&5 %
Old Colony.....dis 15 %
Payne Fettebone & Son, new list.....dis 40&10 %
Payne Fettebone & Son, R. R. Shovels.....dis 15 %
Remington's (Lowman's Patent).....dis 30 %
Son and's.....dis 50&5 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 60&10&2 %
Iron and Brass Head, P. S. & W.....dis 50&10&2 %
Polished Steel, new list.....dis 50&10&2 %

Slates.
Square Frames, by case.....dis 70 %
Less than a case.....dis 65&10 %

Sledges and Stone Breakers.
Nelson Tool Works.....dis 40&10 %
Steel Sledges.....₱ lb 30c, dis 35 %
Steel Face Sledges.....₱ lb 17c, dis 55 %

Spoke Shaves.
Defiance Metallic.....dis 20&10 %
Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.), new list.....dis 30&10 %
Stearns'.....dis 30&10 %

Spoke Trimmers.
Bonney's.....₱ doz $10.80, dis 40&5 %
Stearns'.....₱ doz $9.00, dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₱ doz, dis 55&10 %
Douglass'.....₱ doz $9.00, dis 15 %

Spoons.
Basting.....dis 60&10 %
Riveted Table and Tea.....dis 60&10 %
Solid Table and Tea.....dis 60&10&5 %
Britannia.....dis 60&10 %
Reed & Barton.....dis 40&10&5 %
Holmes, Booth & Haydens.....dis 40&10&5 %
German Silver.....dis 30&10&5 %
Cast Steel, Silver Plated.....dis 33⅓ %
Tin (P. S. & W.), Teas.....$1.25 ₱ gross, net
Tin (P. S. & W.), Tables.....$2.00 ₱ gross, net
Tin (Cowles Hdw. Co.).....dis 10 %
Tin (Cowles Hdw Co.), case lots.....dis 20 %

Stocks and Dies.
"Lightning" Screw Plate.....dis 5&10 %
.....dis 10 %

Stone.
Hindostan No. 1, 6c; Axe, 8c.....dis 40 %
Hindostan Hacker Stone.....₱ gross $12.00 dis 10 %
Sand Stone.....₱ lb 6c, dis 33⅓&10 %
Washita Stone.....No. 1, ₱ lb 20c net
Washita Stone.....No. 2, ₱ lb 16½c net
Washita Stone, Slips.....No. 1, ₱ lb 40c net
Arkansas Stone No. 1, 4 to 6 in.....₱ lb $1.35 net
Arkansas Stone No. 1, 6 to 9 in.....₱ lb $2.00 net
Turkey Oil Stone (Chase).....4 to 8 in., ₱ lb, 60c, dis 10 %
Turkey Slips (Chase).....$1.75 ₱ lb dis 10 %
Lake Superior (Chase).....₱ lb 16c, dis 10 %
Lake Superior, Slips (Chase).....₱ lb 30c, dis 10 %
Grindstones, Family, Loring's.....dis 10 %

Stove Polish.
Joseph Dixon's.....₱ gross $6.00, dis 10 %
Gem.....₱ gross $4.50, dis 10 %
Gold Medal.....₱ gross $6.00, dis 25 %
"Mirror".....₱ gross $6.00, dis 15 %
Ruby.....₱ gross $3.75, net
Rising Sun.....₱ gross $4.75, net
Dixon's Plumbago.....₱ lb 8c, net

Squares.
Steel.....dis 50 %; full cases, dis 50&10 %
Iron.....dis 50 %; full cases, dis 50&10 %
Nickel Plated.....add $2.50 @ $4.00 ₱ doz, net
(2 % cash, EXTRA TO 5 % DIS.)
Try Square and T Bevels.....dis 50&10 %
Disston's Try Square and T Bevels.....dis 40 %
Winterbottom's Try and Mitre.....dis 20&10 %

Tacks, Brads, &c.
New List, Sept. 1, 1882.
Tinned Swedes Tacks.....dis 30 %
Tinned American Tacks.....dis 30 %
Swedes Tacks, all kinds.....dis 30 %
American Cut Tacks.....dis 30 %
Copper Tacks and Nails.....dis 30 %
Swedes Hungarian Nails.....dis 30 %
Gimp and Lace Tacks.....dis 30 %
Gimp and Lace Tacks, Tinned.....dis 30 %
Finishing Nails.....dis 25 %
Trunk and Clout Nails.....dis 25 %
Common and Patent Brads.....dis 25 %
Basket Nails.....dis 20 %
Brush Tacks.....dis 20 %
Leathered Carpet Tacks.....dis 20 %
Cigar Box Nails.....dis 20 %
Chair Nails.....dis 20 %
Double-pointed Tacks.....dis 40&5 %

Tap Borers.
Common and Ring.....dis 20 %
Ives' Tap Borers.....dis 15&10 %
Enterprise Mfg. Co.....dis 25 %

Tapes, Measuring.
American.....dis 20 %
Spring.....dis 25&10 %
Chesterman's.....dis 30&2½ %

Thermometers.
Tin Case.....dis 75 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 25 %
Wood Bottom.....₱ doz $10.00, dis 20&10 %
All Iron.....₱ doz $8.25, dis 20&10 %
Nashua Lock Co.'s.....₱ doz $18.00 dis 50&5 %
Wilson's.....dis 35 %
Clipper (Sargent & Co.).....₱ doz $18.00, dis 20 & 10 %

Toe Calks.
Winsted.....₱ lb 9c, dis 5

Tinners' Tools and Machines.
Machines (P. S. & W.).....list add 20 %
Tools (P. S. & W.).....add 6 %
(dis 10 %)

Transom Lifters.
Wollensak's Patent.....dis 35 %
Reiher's Patent, new list, Feb., 1882.....dis 20&10&10 %
Excelsior.....dis 50&10&2 %

Traps.
Game, Newhouse.....dis 35 %
Game, Oneida Pattern.....dis 55&50&60 %
Game, Blake's Patent.....dis 40 %
Mouse, Wood, Choker.....₱ doz holes, 16½c
Mouse, Round Wire.....₱ doz $1.50, dis 10 %
Mouse Cage, Wire.....₱ doz $2.50, dis 10 %
Mouse, Catch-em-alive.....₱ doz $2.50, dis 10 %
Mouse, "Bonanza".....per gross $10 net
Rat, "Decoy".....₱ doz $10.00, dis 10 %

Trowels.
Lothrops' Brick and Plastering.....dis 25 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 20 %
Peace's Plastering.....dis 15 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 %
Bradley' Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 55 %

Triers.
Butter and Cheese.....dis 25 %

Trucks (Warehouse, &c.
Penfield Block Co.'s list, 1882.....dis 35 %

Vises.
Solid Box.....dis 45 %
Solid "Crown" (A. H. Hilditch).....40 to 100 ₱ lb, 15c net
Solid, Peter Wright's.....net
Solid, Wilkinson's.....14@15c
Parallel, Parker's.....dis 10 %
Parallel, Wilson's.....dis 35&10 %
Parallel, Howard's.....dis 20&10 %
Parallel, Merrill's.....dis 15 %
Parallel, Sargent's.....dis 6 &10 %
Parallel, Backus and Union.....dis 40 %
Parallel, Oval Slide.....dis 40 %
Parallel, Double Screw Leg.....dis 15&10 %
Parallel, Pratts.....dis 25 %
Parallel, Simpson's Adjustable.....dis 25&5 %
"Family," List.....net
Saw Filers, Bonney's.....₱ doz $24.00, dis 20&10 %
Saw Filers, Stearn's.....dis 20&10 %
Saw Filers, Hopkins'.....₱ doz $17.50, dis 10 %
Saw Filers, Reading.....dis 40&10 %
Cowell Hand Vises.....dis 20 %
Richardson's Vise and Anvil.....dis 25 %

Wasner Cutters.
Smith's Patent.....₱ doz $12.00, dis 25 %
Johnson's.....₱ doz $11.00, dis 33⅓ %
Penny's.....₱ doz $14.00 and $16.00, dis 55 %
Appleton's.....₱ doz $16.00, dis 60&10 %

Washers.—See Nuts and Washers.

Well Wheels.....dis 55&10 %

Wire.
Brass and Copper.....dis 30 %
Market, Bright and Annealed.....dis 52½ @ 55 %
Market, Coppered.....dis 47½ @ 50 %
Market, Galvanized.....dis 42½ @ 45 %
Market, Tinned, Tinned list.....dis 45 @ 47½ %
Stone, Bright and Annealed, Nos 16 to 18.dis 52½ @ 55 %
Stone, Bright and Annealed, Nos. 19 to 26.dis 50 @ 52½ %
Stone, Bright and Annealed, Nos. 27 to 36.dis 05 @ 52½ %
Stone, Galvanized, Nos. 19 to 36.....dis 42½ @ 45 %
Stone, Tinned, Tinned list.....dis 45 @ 47½ %
Tinned Broom Wire.....dis 55 @ 57½ %
Cast Steel Wire.....dis 45 @ 47½ %
Annealed Fence, Nos. 8 & 9.....dis 52½ @ 55 %
Annealed Grape, Nos. 10 to 14.....dis 52½ @ 55 %
Fence Staples.....₱ lb 4½ @ 4¾c
Fence Staples, Galvanized.....₱ lb 7 @ 7¼c
Stubs Steel Wire.....$5.00 to & dis 30 %
Japanned Barb Fence.....₱ lb 8 c
Galvanized Barb Fence.....₱ lb 9 c
Steel Music Wire, Nos. 7 to 30.....7½c ₱ lb
Judd's Picture Wire.....dis 40&10 %
Clothes Line Wire, Galvanized.....₱ coil 25 @ 40c net
Wire Cloth, green, drab and black...₱ sq. ft., 2½c net

Wrenches.
American, Adjustable.....25 @ 40 %
Baxter's Adjustable "S," list Jan., 1882.....dis 20&5 %
Baxter's Diagonal.....dis 20&5 %
Coes' Genuine.....dis 50 %
Coes "Mechanics".....dis 50&10 %
Coes' Pattern, Malleable.....dis 75 %
Coes' Pattern Wrought.....dis 60 @ 65 %
Girard Standard.....dis 50&10 %
Girard Agt.....dis 50&10 %
Bemis & Call's Patent Combination.....dis 20 %
Bemis & Call's Merrick 's Pattern.....dis 45 %
Bemis & Call's Brigg's Pattern.....dis 25 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40 %
Van Wagoner & Williams' Basin.....₱ doz $4.50
Aiken Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₱ doz $8, dis 60 %
Webster's Patent Combination.....dis 25 %

Wringers.

	Per doz.
Universal, XX, No. 3½	45.00
Universal, XX, No. 2	48.00
Universal, XX, No. 1½	54.00
Universal, XX, No. 1	59.00
Peerless, no Cogs, No. 1	42.00
Peerless, with Cogs, No. 2½	45.00
Peerless, with Cogs, No. 2	48.00
Peerless, with Cogs, No. 3	54.00
Peerless, with Cogs, No. 4	66.00
Eureka, No. 2	42.00
Novelty No. 2, for Common Tubs	$42.00
Novelty No. 3, for Common Tubs	48.00
Excelsior No. E, for Stationary Tubs	51.00
Excelsior No. F, for Stationary Tubs	57.00
Excelsior No. A, with Folding Bench	60.00
Excelsior No. B, with Folding Bench	66.00

(Lots of 1 doz., dis $1 ₱ doz.; lots of 5 doz., dis $5 ₱ doz.)

NEW YORK WHOLESALE PRICES, February 28, 1883.

METALS.

IRON.—DUTY. Bars, 1 to 1½c. ₩ lb; Sheet, Band Hoop and Scroll, 1¼ to 1¾c. ₩ lb; provided, that none of the above iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ lb; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 ₩ ton. Railroad, 70c. ₩ 100 lb. Boiler and Plate, 1½c. ₩ lb.

American Iron.

Foundry, No. IX	₩ ton	$24.50 @ 25.00
Foundry, No. XX	₩ ton	22.50 @ 23.00
Gray Forge	₩ ton	19.50 @ 20.50

Scotch Iron.

Eglinton	₩ ton	21.50 @ 22 00
Cambroe	₩ ton	22.00 @ 22.50
Coltness	₩ ton	24.50 @ 25.00
Gleneamock	₩ ton	22.00 @ 24.50
Gartsherrie	₩ ton	24.50 @ 25.00
Langloan	₩ ton	24.00 @ 24.50

English Iron.

Redcar No. 3, in store	₩ ton	18.00

Rails.

Iron	₩ ton	Nominal.
Steel at Eastern mills	₩ ton	30.00 @ 40.00
Old Rails T's	₩ ton	24.00 @ 25.00
Old Rails D B	₩ ton	27.00 @ 27.50

Scrap.

Wrought Scrap ₩ ton, from yard		26.00 @ 27.00
Steel Crop Ends		22.50

Bar Iron from Store.

Common Iron		
¾ to 1 in. round and square	₩ lb	2.30c
1 to 6 in. x ½ to 1 in.		
Refined Iron:		
¾ to 2 in. round and square	₩ lb	2.50c
1 to 6 in. x ¾ to 1 in.		
2 to 6 in. x ¼ and 5-16	₩ lb	2.70c
Rods—⅜ and 11-16 round and square	₩ lb	2.60c
Bands—1 to 6x3-16 to No. 12	₩ lb	3c
Norway Nail Rods		4½ @ 4¾c

Sheet Iron.

	Common American	R. G. American.
Nos. 10 to 20	₩ lb 4 c	5 c
21 to 24	₩ lb 4¼c	5¼c
25 to 26	₩ lb 4½c	5½c
27	₩ lb 4¾c	5¾c
28	₩ lb 5 c	6¼c
	B. B.	20 qual.
Galvanized, 10 to 20	₩ lb 8 c	7 c
Galvanized, 21 to 24	₩ lb 8½c	7½c
Galvanized, 25 to 26	₩ lb 9¼c	8 c
Galvanized, 27	₩ lb 10¼c	8½c
Galvanized, 28	₩ lb 11 c	9 c
Patent Planished	A ₩ lb 10½c	B. 9 c
Russia	₩ lb 11 @ 12 c	
American Cold Rolled	₩ lb	c @ 7½c

COPPER.—DUTY: Pig, Bar and Ingot, 5c; Old Copper 4c ₩ lb; Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

American Ingot ₩ lb See Trade Report.

SHEATHING BRAZIERS COPPER, BOLTS, &c.

Brazier's Copper, ordinary sizes, 16 oz. per sq. ft., and over ₩ lb 30c

Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. ₩ sq. ft. ₩ lb 33c

Braziers' Copper, 10 oz. and 12 oz., ₩ sq. ft. ₩ lb 34c

Braziers' Copper, Lighter than 10 oz. ₩ sq. ft. ₩ lb 36c

Circles less than 24 in. in diameter ₩ lb 33c

Circles 24 in. diameter and over ₩ lb 36c

Segment and Pattern Sheets ₩ lb 33c

Locomotive Fire Box Sheets ₩ lb 30c

Sheathing Copper, over 12 oz. ₩ sq. ft. ₩ lb 28c

Bolt Copper ₩ lb 30c

Copper Bottoms ₩ lb 31 @ 32c

No Copper is Sheathing except 14x42 inches, and not to exceed 24 oz. to the sq. ft.

TINNING.

Sheets 14 x 28 ₩ sheet 6c

All other size Sheets, 1 ½c ₩ sq. ft.

For tinning both sides, double the above amount.

O'NEILS PATENT PLANISHED COPPER.—Net.

14x48.

14 and 16 oz. and heavier ₩ lb 37c By the case ₩ lb 36c

12 oz. and lighter ₩ lb 40c ₩ lb 39c

Boiler Sizes.

In. 14x42. 8 in., 14x46. 9 in., 14x60.

14 and 16 oz. and heavier ₩ lb 39c By the case ₩ lb 38c

(And all sizes not over 20 in. wide.)

24x48x3/16.

14 and 16 oz. and heavier ₩ lb 41c

12 oz ₩ lb 44c

BRASS.

Brown & Sharp's Gauge the Standard for Metals.
Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.—dis. 30 %.

June 10, 1880.

Cash prices for Rods and Sheet Brass. For less quantities than 100 lbs add 3c. ₩ lb.

HIGH BRASS.

All Nos. not thinner than 20 No. 28, wider than 7 in., not wider than 14 in. 30c

All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive 35c

All Nos. to No. 38, inclusive, and widths over 20 to 30 in., inclusive 39c

¼c. ₩ lb advance on each No. above Nos. 28 to 38 inclusive.

All Brass thinner than No. 38 is Platers' Brass, at 53c

Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in. in width wider than 2 in. 37c

Painters' Rules 45c

Sheets wider than 30 in. and under 40 in. 47c

" 40 in. and over 50c

Circular Sheets, in diam. from 4 in. to 14, inclusive, over 14 " 20 " " 30 " " 40 in. 40c 45c 45c 50c

LOW BRASS.

₩ lb more than High Brass.

Gilding Metal, 8c ₩ lb more than High Brass.

Platers or Gold Metal { in Bars 48c; Sawed 51c; Planed or Polished 54c

FOR SLITTING.

Metal, in width 2 in. to ⅛ in. to No. 28, inclusive, 1c ₩ lb advance.

Metal, in width 2 in. to 1 in. thinner than No. 28, 2c ₩ lb advance.

Metal, in width 1 in. to ⅛ in. thinner than No. 28, 3c ₩ lb advance.

Metal in width ⅛ in. to ¼ inclusive, not thinner than No. 26, 2c ₩ lb advance.

Metal, in width ⅛ in. to ¼ thinner than No. 28, 5c ₩ lb advance.

Metal, ¼ in. in width and less, 10c ₩ lb advance.

Any of the above widths cut to particular lengths, add 7c ₩ lb.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire
4 per cent., 12 inch to No. 26	$0.52	$ .72
6 " " "	.56	.76
8 " " "	.64	.88
10 " " "	.74	1.03
12 " " "	.81	1.12

German Silver Sheets over 12in. wide and weighing more than 10 lb., $2 ₩ lb.

Advance 20c. for each additional inch in width above 12 in. and 2c. ₩ lb on each No. thinner than Nos. 26 to 36, inclusive.

All German Silver thinner that No. 36 is Platers', at 6c. ₩ lb additional.

German Silver Scrap, one-half less than net price of 12in. Market Metal. German Silver Turnings, Fillings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 6 to 20	$0.33	$0.37	$0.42
No. 21	.36	.40	.46
No. 22	.37	.41	.47
No. 23	.38	.42	.48
No. 24	.40	.44	.50
No. 25	.43	.47	.53
No. 26	.44	.49	.55
No. 27	.48	.53	.58
No. 28	.52	.56	.63
No. 29	.55	.59	.66
No. 30	.58	.62	.72
No. 31	.62	.66	.78
No. 32	.66	.70	.84
No. 33	.70	.74	.91
No. 34	.74	.78	1.03

Spring Wire 2c ₩ lb advance

Flat Square and Half-Round Wire 5c ₩ lb advance on Round Wire.

Fancy Wire not less than 10c ₩ lb advance on Round Wire.

Brass Rods, No. 8 and larger, not less than 2 feet lengths, 38c.

Wire straightened and cut smaller than No. 8 and not less than 2 feet lengths, 43c.

Wire and Rods less than 2 feet lengths, special rates.

Twelve cents per lb extra for spooling on 1 lb spools No 36.

MISCELLANEOUS.

Brass Pull Ears	$0.40
Brass Door Rail	.45

SCRAP—Net.

High Brass Scrap	12c
Low Brass Scrap	14c
Gilding	10c

Turnings, Filings and Chips half the price of scrap.

Terms—Net cash. Interest to be added after thirty days.

TUBING—dis. 20 %.

	₩ lb
No 20 inclusive above ¼ in. to 3 in.	$ .42
Plain above 3 in.	.43
Nos. 21, 22, 23, two cents advance on List for each Number.	
Nos. 24, 25, 26, four cents advance on List for each Number.	
Above No. 26, special rates.	
Plain, ¼ inch	7c
Plain, 3/16 inch	1.1c
Plain, 5/16 inch	1.6c
All Standard Drawn Tubes, 4 cents advance on List Prices.	
Fancy Tubing to No. 26	40
English, Scotch and Extra Patterns Fancy Tubing to No. 20	55

Tubing sawed or Cut 2 to 4 feet long, 3 cents advance on List.

Add two cents. ¼ cent for each additional cutting under 2 feet

All Mandrel Drawn Tubes under ¾ in. 25 cents per pound advance.

ZINC TUBING—dis. 25 %.

Plain	27
Fancy	33
Scotch and Extra Patterns	36

GERMAN SILVER TUBING.—dis 25 %.

¼ Per cent.	.80
½ Per cent.	.90
¾ Per cent.	1.00
1 Per cent.	1.20
1½ Per cent.	1.35
1¾ Per cent.	1.45
2 Per cent.	1.50
2½ Per cent.	1.60

STEEL.—DUTY: Bars, Ingots, Sheets and Coils, valued at 7c ₩ lb, or under, 2¼c; over 7c and not above 11, 2c ₩ lb; over 11, 3½c ₩ lb, and 10 % ad val. Railway Bars, 1¼c ₩ lb. Railway Bars, in part Steel, 10 ₩ lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

For American Steel see quotations under heading of Pittsburgh.

English Steel.

Best Cast	₩ lb 15½c
Extra Cast	₩ lb 10½c
Round Machinery, Cast	₩ lb 10c
Swaged, Cast	₩ lb 18c
Best Double Shear	₩ lb 15½c
Blister, 1st quality	₩ lb 13c
German Steel, Best	₩ lb 11c
2d quality	₩ lb 10c
3d quality	₩ lb 9c
Sheet Cast Steel, 1st quality	₩ lb 15½c
2d quality	₩ lb 14½c
3d quality	₩ lb 12½c

ANTIMONY See Trade Report

LEAD.—DUTY: Pig, $2 ₩ 100 lb Old Lead, 1½c ₩ lb

Pipe and Sheet, 3½c ₩ lb.

American	5 @ 5½c
Bar	6½c. net
Pipe	6½c, dis 10 %
Tin Lined Pipe	11c, dis 10 %
Sheet	7½c, dis 10 %
Shot	Drop 7c, Buck. 8c
Chilled Shot	8c

BABBITT METAL.

N. P. U.	₩ lb 8c
A. 28c; B. 22c; C. 15.	

TIN.—DUTY Plates, Sheets Tagger and Terne, 1.10 ₩ lb; Electro-galvanized Plates, 2c ₩ lb; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.

Banca	₩ lb 28½ @ 29c
Straits	₩ lb 29c
English	₩ lb 27½c

TIN PLATES.

I C 10x14	Prime Charcoal	$5.50 @ 6.75
I C 14x20		
I C 12x12	Prime Charcoal	6.75
I X 10x14	Prime Charcoal	8.25
I X 14x20		
I X 12x12, Prime Charcoal		8.50
D C 12½x17, Prime Charcoal		5.00 @ 5.25
D X 12½x17, Prime Charcoal		8.25
For each additional X add		2.00

COKE TIN PLATE.

	Best.	Ordinary.
I C 10x14	$5.75	$5.25 @ 5.50
I C 14x20		
I C 12x12	6.00	5.50 @ 5.75

TERNE PLATE.

	Prime Char.	2d Qual.	Coke.
I C 14x20	$4.62½ @ 4.75	4.75	4.25 @ 4.37½
I X 14x20	7.50	....	....
I C 20x28	11.50	11.00 @ 11.25	10.75 @ 11.00
I X 20x28	15.50	....	....
I C 20x30	10.50	....	....
I C 14x20 M. F. Brand			$7.50 @ 7.62½

SOLDER—½ & ½ 13½c

Extra .14c

No. 1 12½c

SPELTER.—DUTY: in Pigs, Bars and Plates, $1.50 ₩ 100 lb.

American, cash	5.00 @ 5.25

ZINC.—DUTY Pig or Block, $1.50 ₩ 100 lb; Sheet 2½c ₩ lb.

Sheet, Cask	6½ @ 6¾c
Sheet, Open	7 @ 7½c

Paper Stock, &c.

(Dealers' Selling Prices.)

	Cents ₩ lb
White Shirt Cuttings, No. 1	7 @ 7½
White Shirt Cuttings, No. 2	5 @ 5½
Mill Assorted Whites	3½ @ 4
Unbleached Muslins	4½ @ 4¾
City Whites, No. 1	4¾ @ 5
New Canton Flannels	@ 6¼
New Seconds, light	3½ @ 3¾
New Seconds, dark	3 @ 3½
No. 2 Whites	2½ @ 2¾
Cotton Canvas	4½ @ 4¾
Linen Canvas, No. 1	4½ @ 4¾
Seconds, City No. 1	1¾ @ 1¾
Seconds, City No. 2	1¼ @ 1½
Colors, per 100 lbs	@ 60
Manila Rope	3½ @ 3¾
Manila Rope, Tarred	3½ @ 3¾
Gunny Bagging, No. 1	2½ @ 2¾
Gunny Bagging, No. 2	2¼ @ 2½
Kentucky Bagging	4½ @ 4¾
Burlap Bagging, No. 1	2¾ @ 3
Tar Shakings	2 @ 2½
Hemp Twine Stock	4½ @ 4¾
Hard White Shavings, No. 1	4¼ @ 4½
Soft White Shavings, No. 1	3¼ @ 3½
White Shavings, No. 2, soft	@ 3¼
Mixed Shavings, part white	2½ @ 3
Ledger and Writing	3 @ 3½
Solid Stock	2½ @ 2¾
Book Stock, No. 1, light	1¾ @ 1¾
Old Newspapers	1¾ @ 1¾
Pure Manillas	3½ @ 3¾
Bogus Manilas and Hardwares	¾ @ 1
Commons per 100 lbs	60 @ 70
Binders' Board Cuttings	1½ @ 1½
Straw Board Cuttings	¾ @ ¾

Paints, Oils, &c.

Paints.

Black Lamp, Coach Painters	₩ lb 20c
Black Lamp, Ordinary	₩ lb 9c
Black Ivory Drop, fair	12 @ 14c
Black Ivory Drop, best	25c
Black Paint, in oil	kegs 8c; asst'd cans, 11c
Blue Prussian, fair to best	40 @ 45c
Blue Prussian, fair to best, in oil	45 @ 55c
Blue Chinese dry	70c
Blue Ultramarine	18 @ 30c
Brown, Spanish	1½c
Brown, Van Dyke	10 @ 12c
Green, Chrome	15 @ 23c
Green, Chrome, in oil	14 @ 16 @ 24c
Green, Paris	good, 20c; best, 24c
Green, Paris, in oil	good, 30c; best, 45c
Iron Paint, Bright Red	₩ lb 2½c
Iron Paint, Brown	₩ lb 1½c
Iron Paint, Purple	₩ lb 3 c
Iron Paint, Ground in oil, Bright Red	₩ lb 5½c
Iron Paint, Ground in oil, Red	₩ lb 4½c
Iron Paint, Ground in oil, Brown	₩ lb 5½c
Iron Paint, Ground in oil, Purple	₩ lb 6 c
Mineral Paints	3 @ 4c
Orange Mineral	10c
Red Lead, American	7½c
Red Venetian (Eng.) dry	$1.65 @ $1.70
Red Venetian, in oil	asst'd cans, 11c; kegs, 8c
Red Indian dry	9 @ 12c
Rose Pink	10 @ 13c
Sienna, American, Raw, powdered	4c
Sienna, Burnt, powdered	4½c
Sienna, Burnt, in oil	10 @ 16 @ 20c
Sienna, Raw	11 @ 15 @ 25c
Umber, Burnt, powdered	4 @ 6c
Umber, Burnt, in oil	9 @ 12 @ 16c
Umber Raw, powdered	5½ @ 7½c
Umber, Raw, in oil	10 @ 16 @ 18c
Vermilion, Chinese	90c
Vermilion, English	40 @ 48c
Vermilion, American, Common	15c
White Lead, American, pure dry	7c
White Lead, American, pure in oil	7c
White, Paris, English, prime	in bbls. 2 @ 2½c
Yellow Ochre, French	$1.75
Yellow Ochre, French, in oil	asst'd cans, 11c; kegs, 8c
Yellow Ochre, Vermont	in casks, 1½c
Yellow Chrome	17 @ 27c
Yellow Chrome, in oil	14 @ 18 @ 25c
Zinc White, American No. 1, dry	5 @ 6c
Zinc White, American No. 1, in oil	9c
Zinc White, French (Paris) dry	8 @ 10c
Zinc White, French, in oil	10 @ 11c

Oils.

Linseed, Raw, in casks and bbls	55c @ 56c
Linseed, Boiled, in casks and bbls	58c @ 59c
Linseed, Calcutta	59c @ 60c
Bleached Whale	₩ gal. 54c
Bleached Sperm	₩ gal. $1.25
Bleached Elephant	70c
Signal	80c
Prime Lard	90c
No. 1 Extra	85c
West Virginia	130 @ 135c
Drilling	40c
Miners' Oil	44c @ 50c
Fish Oil, pressed	45c @ 46c
Neatsfoot	80c @ 90
Tallow	70c @ 75c
Empire Cylinder Oil	64c
Machinery	40c
Engine	50c

Sundries.

Mineral Wool, ordinary	₩ lb 1 @ 1½c
Mineral Wool, extra	₩ lb 3 @ 3½c
Asphaltum Cuban	4c @ 8c
Asphaltum Egyptian	8½c @ 9c
Benzine	₩ gal. 90 @ 11c
Chalk	80c
Chalk, Rock	90c
Brown, Vandyke, dry's	6½ cent, 90 bbl

Frostings	40
Glue, White	24 @ 35c
Glue, Sheet	20c
Glaziers' Points, Zinc	8c
Gum, Copal	35c
Gum, Damar	25c
Gum Shellac, English	40c
Gum Shellac, English, dark	35c
Litharge	7½c
Pumice Stone, selected Lumps	4 @ 6c
Pumice Stone, Powdered	2½c
Pine Tar, bois	$3.00
Pitch	$2.25
Putty, in bladders	5c
Putty, in bulk	2½c
Rosin—Common and Good—Strained	$1.50
E & F	$2.70 @ $2.80
G & H	$2.80 @ $2.90
I & K	$2.60 @ $2.80
M & N	$2.00 @ $2.25
Spirits Turpentine	53½ @ 53½c
Whiting Spanish	3½c
Waste, No. 1 Cop	10c
Waste, No. 1 White Machine	10c
Waste, No. 2 White Machine	9½c
Waste, No. 1 Colored	7c
Waste, No. 2 Colored	6½c
Waste, Washed Machine	c

Glass.

Prices current per box of 50 feet.
List, January 17, 1882.

Single Thick.

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$10.00	$ 9.25	$ 9.00	$ 8.50
11 x 14 to 16 x 24	11.50	10.75	10.25	9.50
18 x 22 to 20 x 30	14.75	13.75	13.00	11.50
15 x 36 to 24 x 30	16.50	14.75	13.00	
26 x 28 to 24 x 36	17.50	16.00	14.00	
26 x 36 to 26 x 44	18.75	17.25	14.50	
26 x 46 to 30 x 50	20.50	19.25	15.50	
30 x 52 to 30 x 54	22.75	21.00	18.00	
30 x 56 to 34 x 5	24.00	22.00	19.75	
34 x 58 to 34 x 60	25.25	23.50	21.50	
36 x 60 to 40 x 60	28.50	26.00	23.75	

Double Thick.

SIZES.	1st.	2d.	3d.	4th
6 x 8 to 10 x 15	$13.00	$12.25	$11.75	$11.00
11 x 14 to 16 x 24	15.75	14.75	14.00	
18 x 22 to 20 x 30	20.00	18.50	17.00	
15 x 36 to 24 x 38	22.00	20.00	17.75	
26 x 28 to 24 x 36	24.00	22.50	19.25	
26 x 36 to 26 x 44	26.00	23.50	20.00	
26 x 46 to 30 x 50	27.00	25.25	22.00	
30 x 52 to 30 x 54	30.00	28.00	24.00	
30 x 56 to 34 x 56	31.50	29.00	26.25	
34 x 58 to 34 x 60	33.00	31.00	28.50	
36 x 60 to 40 x 60	37.00	34.00	32.00	

Sizes above—$1¼ per box extra for every 5 inch s. An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 50 inches in length, and not making more than 81 united inches will be charged in the 81 united inches bracket.

Discount, 70 to 70 & 5 %

PROVIDENCE TOOL CO.,

MANUFACTURERS OF

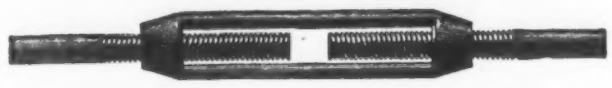
Finished Case-Hardened Hexagon Nuts

Of Uniform Size, and Tapped to U. S. Government Standard.

MACHINERY NUTS,

CHAMFERED AND TRIMMED WITH DRILLED HOLES.

TURN BUCKLES



Of Superior Workmanship and Extra Quality Iron.

SMALL DROP FORGINGS MADE TO ORDER.

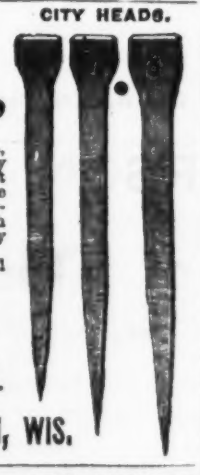
PROVIDENCE, R. I.

REPRESENTED BY

H. B. NEWHALL CO., No. 105 Chambers Street, New York.
J. H. WORK, Nos. 13 and 15 Pearl Street, Boston, Mass.
S. H. & E. Y. MOORE, Nos. 163 and 165 Lake St., Chicago, Ill.

LARGE HEADS. **CHAMPION** CITY HEADS.

Horse Nails,



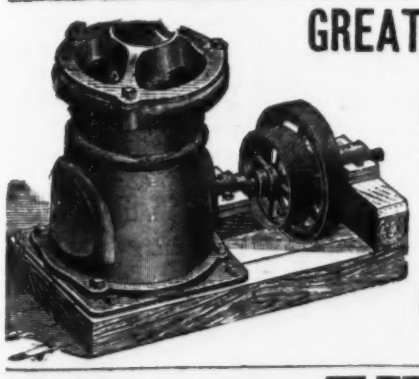
Manufactured from very best NORWAY METAL, that will not SPLIT nor FLAW, are accurately pointed, tough, strong and hold the shoes; soft enough to clinch readily, stiff enough to drive without bending. Every nail uniform and perfect. They are used in thousands of shops with best of satisfaction, and especially liked by "floor-men" for their good reliable driving.
Made in two patterns, "LARGE HEADS" and "CITY HEADS".

QUALITY IS FULLY GUARANTEED.

LIST:

Nos	5	6	7	8	9	10
	26c.	23c.	21c.	20c.	19c.	18c.

CHAMPION HORSE NAIL CO., APPLETON, WIS.



GREATEST ROCK BREAKER ON EARTH.

CAPACITY { A TON A MINUTE. DON'T FORGET IT.

Guaranteed to do Double the Work of any other or Money Refunded.

SEND FOR CIRCULARS.

ALSO

Engines, Boilers Stamp Mills and Mining Machinery.

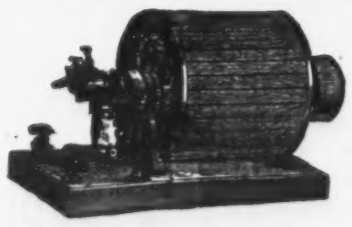
GATES IRON WORKS,

52 Canal St., Chicago.

THE AMERICAN DYNAMO-ELECTRIC MACHINE,

For Electro-Plating, Electrotyping, &c.

Requires no Water. Combining all the



Latest Improvements. Cannot Reverse Current.

The Zucker & Levett Chemical Co.,

GENERAL AGENTS,

Manufacturers and Importers of NICKEL PLATERS' SUPPLIES.

540, 542, 544 & 546 WEST 16TH STREET, N. Y.

NOVELTY IRON FOUNDRY, HAIGHT & CLARK,

16 & 18 DeWitt Street, ALBANY, N. Y.,

MANUFACTURERS OF FINE GRAY IRON CASTINGS OF EVERY DESCRIPTION.

Rosettes and Pickets for Wire Workers, Castings for Furniture and Piano Manufacturers. Iron and Metal Patterns of all kinds a specialty. Correspondence solicited.

JAPANNING. BRONZING.

CHARCOAL BLOOMS

For Sale By

U. S IRON & TIN PLATE COMPANY, Limited,
Demmler P. O., Allegheny Co., Pa.

John T. Lewis & Bros.

No. 231 South Front St.,
PHILADELPHIA.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS.

Brooklyn White Lead Co.

TRADE MARK

White Lead, Red Lead & Litharge.
No. 182 Front Street,
NEW YORK.

JOHN JEWETT & SONS

Manufacturers of the well-known brand of

WHITE LEAD.

JEWETT & SONS' PERFECTLY PURE WHITE LEAD.

TRADE MARK

ALSO MANUFACTURERS OF

LINSEED OIL.

181 Front Street, NEW YORK.

ATLANTIC WHITE LEAD PURE WARRANTED ROBERT COLGATE & Co. TRADE MARK.

The Atlantic White Lead and Linseed Oil Co.,

Manufacturers of

White Lead (Atlantic), Red Lead, Litharge, Glass Makers' Litharge and Orange Mineral;

LINSEED OIL,

Raw, Refined and Boiled.

ROBERT COLGATE & CO.,

257 Pearl St., NEW YORK.

SALEM LEAD COMPANY,

CORRODERS AND MANUFACTURERS OF

PURE WHITE LEAD.

SALEM LEAD CO. 100 WARRANTED PURE SALEM, MASS.

ALSO MANUFACTURERS OF

Lead Pipe and Narrow Sheet Lead.

F. A. BROWN, Treas. SALEM, MASS.

VARIETY METAL BOOM.

Iron Foundry and Machine Shop.

STEAM HEATING BY DIRECT RADIATION in all its Branches a Specialty. Brass and other Metal Moulding, Casting and Finishing. Noiseless Vertical Engines, Hydrants, Fire Plugs, &c.

FRAS. B. BANNAN,
Pottsville, Schuylkill Co., Pa.

CROTON MAGNETIC IRON MINES.

THEALL MINES. McCOLLUM MINES.

BREWSTERS, Putnam Co., N. Y

AVERAGE ANALYSIS.

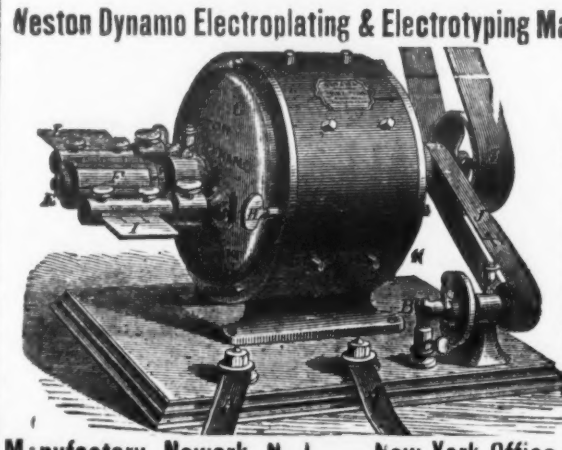
Per-oxide Iron	50.59	Silica	15.70
Protoxide Iron	23.02	Carbonic Acid	—
Protoxide Manganese	.32	Phosphoric Acid	.37
Alumina	3.27	Titanic Acid	—
Magnesia	.76	Sulphur	.58
Lime	1.65	Soda	—
		Water, &c	—

Metallic Iron ..... 53.31 %.
Metallic Manganese ..... .24.
Phosphorus ..... .16.

THE CROTON MAGNETIC IRON MINES are now ready to contract for next year's delivery of their superior **Magnetic Iron Ores,** delivered at Port Morris, New York City or on the line of New York and New England Railroad, Erie Railroad and connections.
The ores are guaranteed to yield 50 % Metallic Iron.

W. E. RIDER, Genl. Manager. Brewsters, Putnam Co., N. Y.
OFFICE, 29 PARK ROW, N. Y. City. P. O. Box 2180.
JOHN H. CHEEVER Pres. J. D. CHEEVER, Treas.

HANSON, VAN WINKLE & CO., Sole Agents for Weston Dynamo Electroplating & Electrotyping Machines, Newark, N. J.



For Nickel, Bronze, Brass, Copper and Silver Plating.

Over 1200 machines in use.
Are used by all leading stove manufacturers.
Experienced men sent to put up machines and instruct purchasers.

INFRINGEMENTS.
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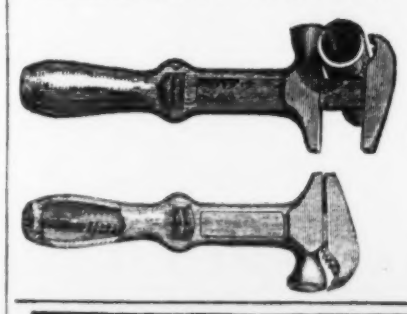

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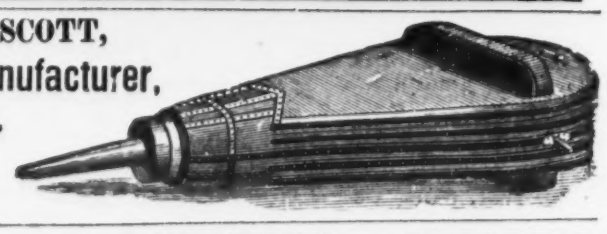

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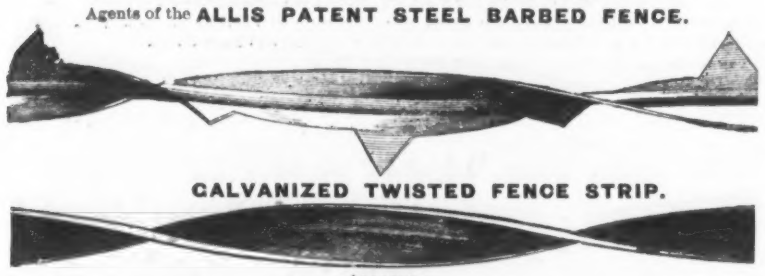

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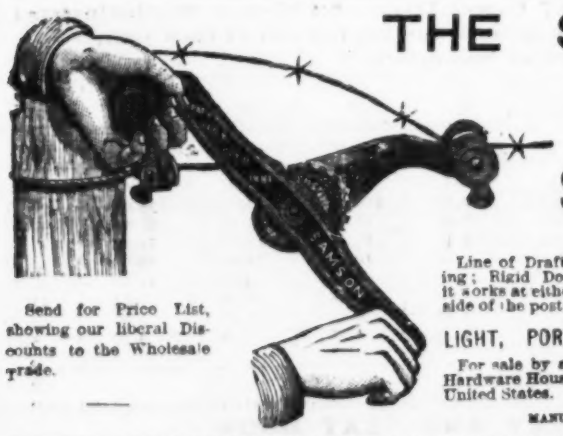

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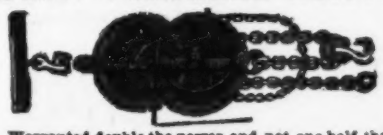

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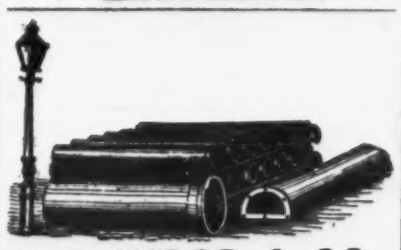

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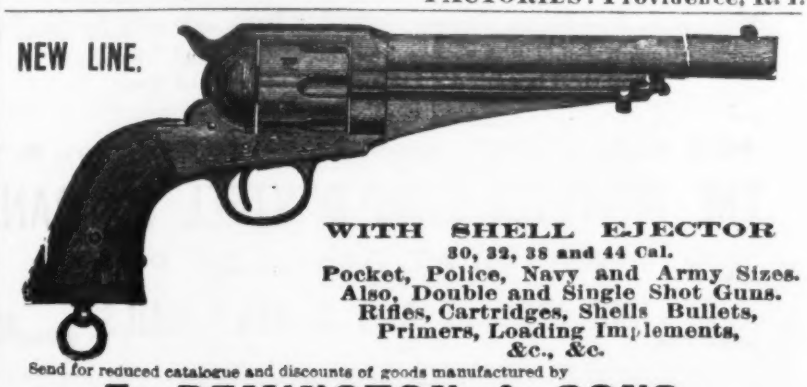

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Coffee Mills.—Box and Side, new list Jan. 1, 1880 ..... dis 45 %
Enterprise ..... dis 25 %

Cutlery.—Walden Pocket ..... new list net
Penna. Knife Co ..... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s ..... dis 60&10 %
Adjustable Handle ..... dis 15 %

Fry Pans.
Tinned ..... dis 40 %

₱ doz.	$5.00	4.00	4.50	6.00	5.50	6.50	7.50	9.00	10.00
No.	0	1	2	3	4	5	6		8

Burnished ..... dis 60 %

₱ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
Fo	0	1	2	3	4	5	6	7	8

Files.
Nicholson ..... dis 40 %
Disston ..... dis 40 %
Butcher ..... $4.50 ₱

Fluting Machines.
Eagle—3¼ in. roll ..... each, $2.25 } dis 25 %
" —4¼ in. roll ..... " 2.85 }
Crown—4½ in. roll ..... " 3.50 }
" —6 in. roll ..... " 4.00 } dis 25 %
" —8 in. roll ..... " 5.50 }
Geneva Fluter ..... dis 25 %
Favorite com Fluter & Sad Iron ..... ₱ doz $10.50 net

Hammers.
Yerkes & Plumb's, new list ..... dis 30 %
Maydole Hammers ..... dis 15 %
Howell A. E. Nail Hammers, ... per doz. net $3.75

Handles.
Disston Loop Handles Crosscut ..... 33c pair net
Boynton Loop Handles Crosscut ..... 13c pair net

Hatchets.
Yerkes & Plumb, new list ..... dis 30 %
Hunt ..... dis 25 %

Hinges.
Strap and T ..... dis 40&10&10&10 %

Horse Nails.

Nos.	4	5	7	8	9	10	
Globe	24	22	19	18	17	16	dis 12½ %
Vulcan	26	23	21	20	19	18	dis 12½ %
Ausable	30	27	25	24	23	22	dis 33⅓ %
" Polished and Pt'd							
& Blued & Pt'd	31	28	26	25	24	23	dis 33⅓ %
Clinton	25	23	21	20	19	18	dis 33⅓ %
" Polished & Pointed	24	22	21	20	19		dis 33⅓ %

Hay and Straw Knives.
Lightning ..... per doz. net $18.00
Electric ..... " " 15.00
Wadsworth ..... " " 12 50
Walton Straw Knives ..... " " 17 00

Locks and Knobs.
Branford ..... new list dis 45&2 %
Gaylord Cabinet ..... dis 25&2 % cash
American Padlocks ..... dis 50&2 % cash
Scandinavian Padlocks ..... dis 40 %

₱ doz.	$4.00	5.50	6.50	7.50	8.50	10.00	12.50	} dis 60 %
No.	57	58	59	60	61	62	63	
₱ doz.			$18.00		26.00		33.00	} dis 60 %
No.			64		65		66	

Lanterns.
Buckeye ..... Large list net; small list net
Tubular ..... No. 0, $3.65; No. 1, $10.15 ₱ doz net
Guards, 35 cents extra per doz. net.

Lawn Mowers.—Pennsylvania ..... } new list
Philadelphia ..... } dis 30 %
Excelsior ..... }

Lawn and Garden Pumps.
Holland Patent ..... List $5.00 dis 10 %

Mattocks.
Long and Short Cutter ..... new list ..... 40 %
Pennsylvania Pattern ..... dis 40 %

Molasses Gates.
Enterprise Mfg Co.'s Measuring Faucets ..... dis 25 %
Stebbins' Gates ..... dis 70&10%
Lincoln's " ..... dis 60&10 %
Landers, Frary & Clark's Petroleum ..... dis 20&10 %
Brass Liquor Cocks, new list Jan. 1 1882 ..... dis 45 %
Cork Lined " ..... dis 70 %

Meat Cutters.
Dixon's ..... dis 25&5 %
Woodruff ..... dis 25&5 %
Stowe ..... dis 25&5 %
Hale's ..... new list, dis 50, 10&5 cash
American ..... dis 25 %
Stuffers ..... dis 25&5 %
Enterprise Stuffers ..... dis 25 %

Planes.—Sandusky Tool Co ..... dis 20 %
Ogonts ..... dis 25 %
Ohio & Auburn ..... dis 20 %
Kelley (S. R. & L. Co.) ..... dis 20&10 %

Plane Irons.—Ohio Tool Co ..... dis. 20 %
Butcher's ..... £. $5.00

Plumbs and Levels.
Stanley's Adjustable ..... dis 55&10 %
" Non-Adjustable ..... dis 60&10 %

Picks.—New list ..... 40 %

Razor Strops.
Lamont Combination ..... per doz. $4.00
" ..... 1 gross lots $42.00
Imitation Emerson ..... per doz. 2.00

Rules.—Stanley Boxwood ..... dis 70 &10 %
Stanley Ivory ..... dis 55&10 %

Steelyards.—Hart's Pattern ..... dis 30&10 %

₱ doz.	$14.50	17.75	21 00	26.50	31 00	35.50
Lbs	50	100	150	200	250	300

American Pattern ..... dis 30&10 %

₱ doz.	$8.00	10.25	13.75	15.50	16.75	19.50
Lbs	50	100	150	200	250	300

Squares.
Steel and Iron ..... dis 50 %; full case, dis 60&10 %
Try squares, Stanley ..... dis 60&10 %
Disston's Try Squares ..... dis 40 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ..... ₱ doz $9.00
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ..... ₱ doz $8.50 } 25
Clipper No. 5, Painted Red, Boxed and Sharpened ..... ₱ doz $8.00

Saws.—Disston's Hand, Panel and Rip ..... dis 20 %
Disston's Circular ..... dis 40 %
Cross-Cut No. 2, Plain Tooth ..... dis 40%
" Patent Tooth ..... dis 40%
" Champion Tooth ..... dis 40%
Boynton's Lightning Cross Cut, new list ..... dis 40 %
" Lightning Buck Saws, cross bar ..... dis 40 %

Shovels and Spades.
Oliver Ames & Sons, new list ..... dis 15 %
Griffiths ..... dis 50@50&5
Rowland ..... dis 50@50&5

Sad Irons.—4 to 10 lbs ..... ₱ ℔ 35@0
Mrs. Potts' Patent ..... dis 35 %

Stone.
Washita Extra ..... ₱ ℔ 28c net
" No. 1 ..... " 20c
" No. 2 ..... " 15½c
" Slips ..... " 40c
" Axe ..... " 130 net
Hindostan Oil Stone No. 1 ..... ₱ ℔ 60 }
" Axe Stone ..... " 80 } dis 33⅓ %
" Slips ..... " 100 }

Screws.
Flat Head Iron, new list Dec. 27 ..... dis. 40 & 10 %
Flat Head Brass, new list Dec. 27 ..... dis 50 & 10 %
Round Head Brass, new list Dec. 27 ..... dis. 40 & 10 %
Round Head Iron, new list Dec. 27 ..... dis. 45 & 10 %

Spoons.
Plated ..... dis 40&5 %
German Silver ..... dis 30 & 10 %
Britannia, Boardman's ..... dis 60 %
" Parker's ..... dis 60&10 %

Tinned. ..... dis 10 %

Springs.—Torrey ..... dis 40&10 %
Gem No. 3 small Jap'd ..... $2.00 } dis 50 %
" No. 2 medium Jap'd ..... 2.75 }
Coil No. 2, per gross net $5.00
Other Standard Springs ..... dis 60&10 %
Warner Door Springs, per doz. net 1.75
Standard Spring Hinges—
Single No. 0, per doz. net 1.25
" No. 1 " " 1.50
Other Standard Spring Hinges ..... dis 25&10 %

Stocks and Dies. ..... dis 10&5 %

Stove Polish.—Gem ..... ₱ gross, $4.50, dis 5 %
Dixon ..... 6.00, dis 10%
Fire Fly ..... $3.00 gross net

Tacks. ..... dis 30&10 %

Shoe Nails—4 & and over 8c ..... } 10 %
" " 3½ & and under 9c ..... }
Double Pointed Tacks ..... dis 40&5 %

Traps.
Genuine Oneida—Newhouse ..... dis 35 %
Im. Oneida—Newhouse list, first qual dis 55&5 @ 60 %

Vises.—Solid Box, Trenton new list ..... dis 35 %

Wrenches.—Agricultural ..... dis 60&10 %
Coes' Genuine ..... dis. 50 %
Coes' Mechanics' ..... dis. 50 & 10 %
" Mall. Bar ..... dis 75 %

Wire.
Bright or Ann'd, No. 0 to 18 ..... dis 50 to 52½ %
" No. 19 to 26 ..... dis 57½ to 60 %
" No. 27 to 36 ..... dis 62½ to 65 %
Coppered, 0 to 18 ..... dis 45 to ⅓ %
Tinned Broom Wire ..... dis 52½ to 55 %
Galvanized Barb Wire 9c
Painted Barb Wire 8c
Galvanized No. 7 to 18 ..... Market List, dis 42½ to 45 %

Wringers.
Perriess No. 2½ $42.00
" No. 2 ..... 45 00
Universal No. 2½ 42.00
" No. 2 ..... 45.00
Novelty No. 2, for common tubs 42 00
" No. 3 " " 48.00
Excelsior E, for stationary tubs 51.00
" F " " 57 00

In lots of 1 doz. $3.00 doz. dis. from above price.

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.

1¼ to 4 by ⅛ to 1 inch 2.5c
4¼ to 6 by ⅛ to 1 " 2.6c
1¼ to 6 by 1¼ to 1¼ " 2.9c
1¼ and 1⅛ by ⅛ to ¼ " 2.6c
1 and 1¼ by ⅛ to ¼ " 2.7c
⅛ ¼ and ⅜ by ⅛ to ⅝ inch 2.8c

Rounds and Squares.

1 to 1⅞	2.5c	⅝ to 9-16	2.7c
2 to 2⅝	2.7c	½ to 7-16	2.9c
2¼ to 3¼	3.0c	⅜	3.1c
3⅜ to 4	3.5c	5-16	3.3c
4¼ to 5	4.0c	¼	3.5c
⅝ to ⅞	2.0c	3-16	5.5c

Oval Iron.

⅞ to 1⅜	2.9c	⅜	3.3c
⅝ to ⅞	3.1c	⅜	3.7c

Half Oval and Half Round.

⅞ to 1¼ inch	3.2c	⅛ inch	4.0c
⅝ to ⅞ "	3.7c	⅜ "	5.5c

Horse Shoe.

⅝ to 1¼ by 5-16 to ⅞ inch 3.5c

Wagon Box Iron.

⅛ Inch, Nos. 13 and 14 ..... 3.7c
⅛ " " 11 and 12 ..... 3.5c
⅛ " " 13 and 14 ..... 3.9c
⅛ " " 11 and 12 ..... 3.8c
⅛ " " 13 and 14 ..... 4.4c
⅛ " " 11 and 12 ..... 4.1c

Heavy Bandr.

1¼ to 6 by ¼ and 5-16 in. 2.7c
1¼ to 3¼ by ¼ and 5-16 " 2.7c
1 to 1¾ by ¼ and 5-16 " 2.8c
¾ to ⅞ by ¼ and 5-16 " 4.0c
⅜ and ⅛ by ¼ and 5-16 " 3.5c

Light Bands.

1¼ to 6 by ⅛ to 3-16 ..... 3.0c
1¼ to 6 by Nos. 11 and 12 ..... 3.1c
1 to 1¾ by ⅛ to 3-16 ..... 3.1c
1 to 1¾ by Nos. 11 and 12 ..... 3.2c
⅛ and 13-16 by ⅛ to 3-16 ..... 3.4c
⅛ and 13-16 by Nos. 11 and 12 ..... 3.5c
⅜ and 11-16 by ⅛ to 3-16 ..... 3.7c
⅜ and 11-16 by Nos. 11 and 12 ..... 3.8c
⅜ and 9-16 by ⅛ to 3 16 ..... 4.0c
⅜ and 9-16 by Nos. 11 and 12 ..... 4.1c
⅛ inch by ⅛ and 3-16 ..... 4.3c
⅛ inch by Nos. 11 and 12 ..... 4.4c

Hoop Iron.

1¼ to 4, Nos. 13, 14 and 15 ..... 3.3c
1¼ to 2, Nos. 16, 17 and 18 ..... 3.4c
1¼ to 2, No. 19 ..... 3.5c
1¼ to 2, No. 20 ..... 3.6c
1¼ to 2, No. 21 ..... 3.7c
1¼ to 2, No. 22 ..... 3.8c
1-16 to 1, and 1¼, Nos. 13, 14 and 15 ..... 3.5c
1-16, 1, and 1¼, Nos. 16, 17 and 18 ..... 3.6c
1-16 to 1, and 1¼, Nos. 19 and 20 ..... 3.7c
1-16, 1, and 1¼, No. 21 ..... 3.8c
1-16, 1, and 1¼, No. 22 ..... 3.9c
1-16, 1, and 1¼, Nos. 13, 14 and 15 ..... 3.9c
1-16, 1, and 1¼, Nos. 16, 17 and 18 ..... 4.0c
1-16, 1, and 1¼, Nos. 19 and 20 ..... 4.1c
1-16, No. 21 ..... 4.2c
1-16, No. 22 ..... 4.3c
⅛, Nos. 13, 14 and 15 ..... 4.0c
⅛, Nos. 16, 17 and 18 ..... 4.1c
⅛, Nos. 19 and 20 ..... 4.2c
⅛, No. 21 ..... 4.3c
⅛, No. 22 ..... 4.4c
11-16, Nos. 13, 14 and 15 ..... 4.3c
11-16, Nos. 16, 17 and 18 ..... 4.3c
11-16, Nos. 19 and 20 ..... 4.4c
11-16, No. 21 ..... 4.5c
11-16, No. 22 ..... 4.6c
⅜, Nos. 13, 14 and 15 ..... 4.4c
⅜, Nos. 16, 17 and 18 ..... 4.5c
⅜, Nos. 19 and 20 ..... 4.6c
⅜, No. 21 ..... 4.7c
⅜, No. 22 ..... 4.8c
⅜, No. 23 ..... 4.9c
9-16, Nos. 13, 14 and 15 ..... 4.6c
9-16, Nos. 16, 17 and 18 ..... 4.7c
9-16, Nos. 19 and 20 ..... 4.8c
9-16, No. 21 ..... 4.9c
9 16, No. 22 ..... 4.9c
9-16, No. 23 ..... 5.0c
⅝ inch, Nos. 13, 14 and 15 ..... 5.1c
⅝ " Nos. 16, 17 and 18 ..... 4.8c
⅝ " Nos. 19 and 20 ..... 5.1c
⅝ " No. 21 ..... 5.2c
⅝ " No. 22 ..... 5.3c
⅝ " No. 23 ..... 5.4c

The prices under Hoop Iron do not apply to Cotton Ties.

1-10c per lb. extra will be charged for each gauge lighter than the lightest indicated.

1-10c per lb. extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.

1¼ to 2 in., cut to length
9 to 11 lbs. per set of 6 hoops 3.5c
8 lbs. and less than 9 lbs. per set of 6 hoops 3.6c
Less than 8 lbs. per set of 6 hoops 3.8c
Extras for Cutting to Length all Preceding Iron.
All Iron, including Tire 1.10c

Tank Iron.

No. 9 and heavier 3.3c
Flow Slabs 3.5c
" Wings 3.8c

Sheet Iron.

	Common.	Charcoal.	Juniata.
No. 10 to 14	3.50	4.0c	6.5c
No. 15 to 17	3.80	5.10	6.8c
No. 18 to 21	4.10	5.5c	7.1c
No. 22 to 24	4.30	5.80	7.3c
No. 25 & 26	4.50	6.0c	7.5c
No. 27	4.70	6.20	7.7c
No. 28	5.1c	6.6c	8.1c

All sheet 18 and lighter, over 30 inches wide, not less than 2.10c extra.

Wood's Patent Planished Sheet.

1st quality (A) ..... 10½c | 2d quality (B) ..... 9 c

Galvanized C. H. B.—Charcoal Hammered Blooms.

Nos. 14 to 20	12c	No. 27	15c
Nos. 21 to 24	13c	No. 28	16c
Nos. 25 and 26	14c	No. 29	18c

40 @ 42½% discount.

Coal Screen Iron.

1¾ by ⅝ by 6-16 ..... 3.0c | 1 by ⅝ by 5-16 ..... 3.5c

Angle Iron.

2½, 3, 3½ and inch 3.3c
1½, 1¾ 2 and 2¼ inch 3.3c
1¾ inch 3.4c
1 " 3.6c
1¼ by 1 in 3b, for Plow Handles 3.8c
1½ by ¾ " " " 3.8c
1⅝ by ¾ " " " 3.9c

T Rail.

8 lbs. to the yard ..... 2.0c | 20 lbs. to the yard 2.8c
12 " " ..... 2.8c | 28 " " 2.8c
16 " " ..... 2.8c | 30 " " 2.8c

Splice Joints for 12, 16 and 20-lb. Rail, 40c each; 28 and 30 lb. Rail, 45c. each; 40 lb., 60c each.
3¼ by ⅜ and ¼ Spikes for 20 and 28-lb. Rail 4½c
2¾ and 3 by ⅜ " " 12 and 16-lb. " 4½c
2⅝ by 5 16 " " 8-lb. Rail 5½c

Flat Rails.—Punched and Countersunk.

1¼ to 2 by ⅛ to ¼ inch 3.0c
1½ by ⅜ and 7-16 inch 3.2c
1¾ by ⅜, 7-16 and ½ inch 3.5c

Juniata Nail Rods 6.5c
Norway " 8.0c
Guard Iron, ¾x⅛ and ½x⅛ 4.0c
" ⅝x⅛ and ½x⅛ 4.0c
Drag Bars 3.5c
Dropper Bars 4.0c
Cylinder and Landside Iron 4.0c
Plow Beam Iron 3.8c

Nails.

See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.

Square, Flat, Octagon and Round.

⅛ to 2 inches, inclusive 12c
1-16 and 2⅛ to 3 inches 13c
¼ and 3¼ to 4 " 14c
7-32 and 4⅛ to 5 " 15c
9-16 and 5⅛ to 6 " 16c
5-32 inch 22c
⅛ inch 30c
Oil Well Steel Forgings 30c

Machinery Steel.

	Crucible.	Bessemer & Open Hearth
Ordinary Sizes, ⅜ to 2 inch	7½c	6c
Round "	8½c	6c
5-16 and 2⅛ to 3 inches "	8½c	6c
¼ and 3¼ to 5 "	9½c	7c
7 32 inch "	10½c	8c
4-16 "	12½c	10c

Square, Flat and Octagon, ½c extra throughout the list.
Cut to specified lengths, ½c extra.

Hammer Cast Steel.

Crucible Cast Steel 8½c
Open Hearth Cast Steel 7c

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth
To 21 gauge	12½c	11c	9c	7c

1c. extra for each additional gauge.
Cut to multiples or specified lengths, ½c. extra.

Miscellaneous Cast Steel.

Auger and Auger Bit 8½c
Axle Steel for carriages and wagons 8½
Frog Points and Plates 10c
" Side Bars 8½c
Pick, plain (hammered) 10c
" and Mattock, beveled (rolled) 8½c
Skate Steel 9c
Table Cutlery, plain 7c
Table Cutlery, beveled 7½c
Pike and Cant Hook 8½c
Coal and Granite Wedge 8½c
Roller 8½c
Spindle, subject to Machinery classification 8½c
Trap Spring Steel 10c
Forged Crank Pins and Lathe Spindles 11c
Piston Rods, plain 8½c
" forged to shapes 10c
Slide Bars, plain 8½c
" forged to shapes 11c

Crucible, Open Hearth or Bessemer

Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick 9½c
Boiler, Fire-Box and Flue Sheets, not less than ⅜ thick 7½c
Circulars and semi-circulars, when ordered separately 8
Smoke Stack, to shape 8
Locomotive Tank Steel 7c

File Cast Steel.

Square, Round, Half Round and Flat Bastard, 8-inch and over 8c
Mill Saw, 8-inch and over 8½c
Taper, 3½-inch and over 9½c
Horse and Shoe Rasp 8½c

Spring Cast Steel. 8½c
Spiral and Taper, cut to lengths 7c

Tire Cast Steel.

1x¼ and over 8½c
1x3-16, ¾x3-16 and ¼ 9c
1 and 1¼-10x⅛ and 6-32, ¾x⅜-10 and 6-32 ..... 9½c
¾ and ⅝x⅛ and 3-32 and 12 g 10c
Solid Safe Cast Steel 12c
Three and Five Ply Cast Steel 7½c
Agricultural Implement Cast Steel.
Fork and Rake, Crucible 8c
Horse Rake Steel, cut to lengths, Crucible 8c
Hoe, Crucible 7½c
Corn Stalk Cutter, beveled 9½c
Beveled Hoe and Shovel Steel in Bars 8½c
Crucible Plow Steel in slabs 6½c
Bessemer and Open Hearth.
Springs 4½c
" spiral and taper, cut to lengths 5½c
Tire, ¾-16 thick and above 4½c
Toe Calk 4½c
Plow 4½c
Axle Billets 4½c
Sleigh Shoe 4c
Cutter Shoe, cut to lengths and tapered 5½c
Scythe Back Steel 4c
Grain Drill Bars 7½c
" Points 8½c
Rolling Coulter Blanks, cut and punched 6½c
Thrashor Steel 4½c
" Teeth 4½c
Rolled Hammer Billets 4½c
Terms.—Four months: 4 per cent. discount for cash if remitted within 30 days.

Rolls and Castings.

Furnace Floor and Straightening Plates 2½c
Housings and Castings not otherwise specified ..... 3 c
Guide Plates 3½c
Spindles and coupling boxes ..... 3 c
Sand Rolls and Pinions, large size 3½c
" small size 3½c
Pipe Mill Castings 3½c
Rolling Mill Castings under 50 lbs ..... 5 c
Spur and Bevel Wheels, large ..... 4 c
" " small ..... 4 c
Pulleys up to 30 inches 4½c
" over 30 inches 4½c
Engine Castings, light 4½c
" " heavy ..... 4 c

Chilled Rolls.

6 to 7 in. diam., 7 to 20 in. long 8c
8 to 15 in. " 8 to 40 in. " 4½c
25 to 32 in. " 15 to 72 in. " 4½c
14 to 31 in. " 72 to 108 in. " 4½c

After Oct. 1, 1881, no discounts will be made at settlement as heretofore, prices quoted being net.

White and Red Lead.

Strictly Pure White Lead in Oil, in kegs 6½c.; in 25 ℔ Tin Pails, ½c. ₱ ℔ over keg price; 12½ ℔ Tin Pails, 1c ₱ ℔ over keg price; assorted, 1 to 5 ℔ cans, 3c. per ℔ over keg price.
Dry White Lead in barrels 6¼
Red Lead, very brilliant, in kegs, 6½c; in barrels 6¼c
Litharge (Potter's Lead) " " 6½c
Freights equalized with all points where White Lead is made.
Terms: Note at sixty days, or if paid within 15 days from date of invoice a discount of 2¼ per cent. will be allowed, but not otherwise.

Window Glass.

Discount, 70 % on Single Strength, 70 & 10 % on Double.

Single Strength.

Size.	AA.	A	B.	C.
5 x 8 to 10 x 15	$8.25	$7.50	$7.00	$6.50
11 x 14 to 16 x 24	9.25	8.50	8.00	7.25
18x 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	8.25
26 x 28 to 24 x 36	13.00	11.50	9.75	9.00
26 x 36 to 26 x 44	14.50	13.25	10.75	9.50
26 x 46 to 30 x 50	15.00	14.00	11.25	10.50
30 x 52 to 30 x 54	16.00	14 5	12.00	
30 x 56 to 34 x 56	17.25	15.5	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	

Double Strength.

6 x 8 to 10 x 15	12.75	11.75	10.75	10.00
11 x 14 to 16 x 24	14.50	13.25	12.50	11.25
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 84 united inches, will be charged in the 84 united inches bracket.

BOSTON.

Reported by Macomber, Bigelow & Dowse.

Anvil & Vise.—
No. 1, $4.25; 2, 4.25; 3, 3.50 each.....dis 25 %

Augers & Bitts.—Snell's Auger.....dis 40&10 %
L'Hommedieu's Ship Auger.....dis 15 %
Jennings's Bitts.....dis 10&10&10 %
Cook's Bitts.....dis 40&10 %
Shepardson's Double-Cut Bitts.....dis 45 %
Shepardson's Double Gimlets.....dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₩ doz., $48.00; No. 3, ₩ doz., $60.00 list..dis 20 %
Bonney's Extension Hollow Augers.....₩ doz $36.00
Pierce's Bitts.....dis 40 %
Griswold Bitts.....dis 40&10 %

Axes.—Blue Jackets.....₩ doz $9.00
Red Cross.....₩ doz 8.00
Red Cross Handled.....₩ doz 12.00
Dowse Handled Boys'.....dis 33⅓ %

Ax Handles.—
Oak Extra, 41 in., No. A.....₩ doz $2.40
Oak Extra, 34 in., No. A.....₩ doz 2.00
Oak Extra, 31 in., No. B.....₩ doz 2.00
Oak Extra, 34 in., No. B.....₩ doz 2.00
Oak Extra, 31 or 34 in., No. C.....₩ doz 1.40

Axle Clips.....dis 50 %
Balances.—Chatillon's.....dis 33⅓ %

Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers).....₩ ft. 20
Cast Half Round.....₩ ft., ⅝, 30; ¾, 40
Wrought Round.....₩ ft., ⅝, 30; ¾, 40; ⅞, 60

Bells.—Connel's Crank Gong, reduced list..dis 15&10 %

Bird Cages.—
Japanned M. B. & D., reduced list, 1879.....dis 40 %
Brass M. B. & D., reduced list '79.....dis 33⅓ %

Blind Fasts.—Lock Fasts.....₩ C sets $6.00
No. 6 Fasts.....₩ C sets 6.00
Veazie Fasts.....₩ C sets 6.00
Shedd's.....₩ C sets 7.00
Blind Hinges.—Mall, Hook, 3 holes.....₩ C sets 7.00

Brad Awl Handles.—
Phœnix Adjustable.....₩ doz $2.00

Bolts.—Norway Iron Carriage.....dis 70&10 %
Common Iron Carriage.....dis 50&5 %

Borax.—Refined.....₩ lb 15c

Boring Machines.—
Eagle Upright each.....$5.50 list } dis 40&10 %
Eagle Angle each.....6.75 list }
Snell Augers.....₩ set $2.45

Braces.—Barber's.....dis 40&5 %
Spofford's.....dis 10&5 %
Backus'.....dis 40&10 %

Bracket Saws.—Holly Scroll Saw.....each $2.25
Demas Lathe and Scroll Saw.....each 6.50
Bracket Saws, extra quality, to No. 5.....₩ gro 0.75
Steel Frame, with patterns.....₩ doz 6.00
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %

Bracket Saw Blades.—Griffith's pat.....₩ gross 7.50

Brackets.—
H. B. & M. Flower Pot, reduced list.....dis 30&10 %
Bronzed Shelf, M. B. & D., new list.....dis 40 %
Store Shelf.....dis 40 %

Butts.—Union Fast Joint.....dis 40&10 %
Union Loose Joint.....dis 40&10 %
Union Japanned Acorn.....dis 50&10 %
Union Silvered Acorn.....dis 55&10 %
Union Boston Finish.....dis 70&10 %
Union Spiral Spring.....dis 25&10 %
Wrought Brass.....dis 60& 10%

Carriage Bolts.—Eagle Norway.....dis 70&10 %
Common.....dis 80 & 5 %

Carriage Jacks.—Climax No. 1.....₩ doz $30.00
Climax No. 1½.....₩ doz 15.00
Climax No 2.....₩ doz 13.50
Universal.....dis 25 %
Universal No. 1.....each, $2.00
Universal No. 2.....each 3.00
Universal No. 3.....each 6.00
Universal No. 4.....each 6.00
Universal No. 4.....each 6.50

Cartridges.—U. S. Cartridge Co.....dis 70 %

Cards.—
Watson's make Horse & Curry... dis 10 %
Watson's Cotton..... dis 70 %
Watson's Wool..... dis 10 %
} New List, July, 1881.

Casters.—Bed and Table.....dis 40 %

Chain.—Traces 6/0, 10, 4, straight.....₩ pair 50c
Traces 6/0, 10, 4, twisted.....₩ pair 55c
Traces 7, 12, 2, twisted.....₩ pair 80c
Coil 3/16.....₩ lb 10c
Coil ¼.....₩ lb 9½c
Coil 5/16.....₩ lb 8c
Coil ⅜.....₩ lb 6½c
Coil 7/16.....₩ lb 6½c
Coil ½.....₩ lb 6c

Chalk.—White, Carpenter's.....₩ gross 60c
Red, Carpenter's.....₩ gross 80c
Blue, Carpenter's.....₩ gross $1.00

Chisels.—Hart, Bliven & Mead, Framing..dis 60&10&10%
Underhill, Framing.....dis 25 %
Buck's Chisels.....dis 30 %

Clothes Line.—
Galvanized Wire, 100 feet each.....₩ doz $1.00

Coal Hods.—"Dover."—Galvanized, New List..dis 60%
Japanned, new list.....dis 50 %

Coffee Mills.—New List.....dis 45 %

Copper Rivets.....dis 33⅓ %

Cow Ties.—
No. 30, 5 ft. No. 6 Wire, with toggle.....₩ doz $3.80
No. 34, 5 ft. No. 6 Wire, with snap.....₩ doz 4.00
No. 40, 3½ feet No. 6 Wire, with toggle.....₩ doz 4.50
No. 45, 3½ ft. No. 6 Wire, with snap.....₩ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle.....₩ doz 4.75
No. 55, 4 ft. No. 4 Wire, with snap.....₩ doz 5.00
No. 60, 4½ ft. No. 3 Wire, with toggle.....₩ doz 5.60
No. 65, 4½ ft. No. 3 Wire, with snap.....₩ doz 5.80

Cocks.—Brass, L. F. & Co.....dis 40 %
Cordage.—Manila, usual trade dis 1c.....₩ lb 16½c
Jute.....₩ lb 9c
Crow-Bars.—Cast Steel.....₩ lb 7½c
Iron, Steel-pointed.....₩ lb 6c

Cutlery.—Pocket American Shear Co.'s.....dis 40 %
Butcher Knives Wood's, Lap Bolster, Square Handle.....dis 30 %
Steak Knives.....dis 25 %
Lap Bolster, Oval Handle.....dis 20 %
Sticking.....dis 20 %
Skinning.....dis 30 %
Butcher, Common Round Handle, Wood's.....dis 20 %
Shoe Knives, Wood's.....dis 20 %

Dividers.—Cook's.....dis 25 %
Dog Collars......dis 20 %
Dog Muzzles.—Automatic.....dis 15 %

Door Springs.—Torrey's Rod.....₩ doz $1.62
Imitation Torrey's Rod.....₩ doz 1.40
Gem Coil, new list.....dis 50 %
Crown.....₩ doz 1.20
Warner's.....₩ doz 2.00
Door Stops.—Thurston's.....dis 50 %
Drawer Knobs.—Thurston's.....dis 50 %

Drills.—Morse Bitt Stock.....dis 25 %
Morse Straight Shank.....dis 20 %

Emery.—Wellington Mills.....₩ lb 10c
Walpole Emery Mills.....₩ lb 9c
Turkish in 10 lb cans.....₩ lb 8c

Enameled Ware.—
Standard Mfg. Co. Kettles.....dis 40 & 10 %
Standard Sauce Pans.....dis 25 %

Felloe Plates.—Wrought.....₩ lb

Files.—American File Co.....dis 45 %
Nicholson File Co.....dis 40 %

Fluting Machines.—Knox list, $4.00.....dis 20 %
American list, $3.40.....dis 20 %

Forks.—W. C. & Co. Manure.....dis 50 %

Gimlet Bits.—
Genuine German, No. 125, 1-32 to 8-32, per doz $1.0
Pierce's.....per doz .88

Glass Cutters.—Combination Glass Cutter and Knife Sharpener.....₩ doz $1.00

Grub Hoes.—K. P. & Co.'s No 2, $11.40 ₩ doz..dis 40 %

Hammers.—Maydole's.....dis 15 %
Eartford Hammer Co.....dis 20 %

Hangers & Rollers.—Anti-Friction.....dis 50 %
Acme Rollers.....dis 50 %
Climax.....dis 50 %
Common Hangers.....dis 50 %
Common Rollers.....dis 40 %

Hand Screws......dis 10 %

Hatchets.—C. F. Dowse new list.....dis 33⅓ %
Underhill.....dis 25 %

Hay Knives.—Lightning.....₩ doz. $18.00, net
Fisher's Patent.....₩ doz $14.00

Hinges.—Strap and T (new list).....dis 4×10 10 %
Providence Plate.....₩ lb 15½ %
Wrought Screw Hook.....₩ lb 15½ %

Hoes.—W. C. & Co.'s.....dis 50 %

Hooks and Staples.—Brewers' (new list).....dis 60 %

Horse Nails...... No. 6 7 8 9
National Finished.....23 .21 .20 .19....dis 20 %
Putnam Pointed.....24 .22 .21 .20.....5 %

Horse Nails.—Bridgewater.....dis 25 %
No. 6, 23; No. 7, 21; No. 8, 20; No. 9, 19.

Ice Cream Freezers.—Packer's, new list.....dis 50%

Knobs.—"Norwalk." New list.....dis 45 %
Silver Glass.....dis 50&10 %
Silver Glass Bell Pulls.....dis 50&10 %

Lanterns.—Tubulars, No. 0.....₩ doz 8.00
Railroad, Oil, No. 43.....₩ doz 9.00
Triangular.....₩ doz 4.00

Lawn Mowers.—The "Daisy."
12 in. cut.....each, $8.00
14 in. cut.....each 8.50
16 in. cut.....each. 9.00
18 in. cut.....each, 9.50

Lead.—Sheet.....₩ lb 7½c
Pipe.....₩ lb 08½c

Locks.—Norwalk.....dis 45 %
Eagle Cabinet.....dis 25 %
Eagle Trunk.....dis 15 %
W. Wilcox & Co., Padlocks.....dis 30 %

Manure Forks.—W. C. & Co.....dis 30 %

Mattocks.—
K. P. & Co., Long Cutter, $16.00 ₩ doz.....dis 40 %
K. P. & Co., Short Cutter, $15.50 ₩ doz.....dis 40 %
K. P. & Co., Pick Cutter, $16.00 ₩ doz.....dis 40 %

Measuring Tapes.—Eddy's.....dis 20 %

Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's, (new list).....dis 40 & 10 %
American.....dis 25 %

Money Drawers.—Tucker'ar's Am.....₩ doz $22.50

Mouse Traps.—Delusion.....₩ doz 2.00
Novelty.....₩ doz

Nails.....₩ keg 3.50

Oilers.—Zinc and Tin.....dis 40 %
Brass and Copper.....dis 40 %

Ox Bows.—Extra finished and varnished.....dis 10 %
1⅛ in., ₩ doz. pair...$7.00 | 2 in., ₩ doz. pair. $10.00
1⅜ in., ₩ doz. pair... 9.00 | 2½ in., ₩ doz. pair . 13.00

Paper.—Tarred Sheathing.....₩ lb 2½c
Tarred Eagle Brand.....₩ lb 2½c

Picks.—K. P. & Co., Adze Eye, 5 to 6 lb $12.00...dis 40 %
K. P. & Co., Adze Eye, 6 to 7 lb $13.00.....dis 40 %

Planes.—
Fancy Planes.....dis 15 %
Razee Planes.....dis 20 %
N. Y. Tool Co.....dis 25 %
English Iron.....dis 20 %
Bailey's.....dis 20&10 %

Plated Ware.—Rogers & Bro.....dis 40&5 %

Pliers.—Vom Cleff & Co.'s.....net list
Button's Wire Pliers.....dis 33⅓ %

Plumb & Levels.—Stanley R. & L. Co.....dis 60&10 %

Pocket Knives.—American Shear Co.'s.....dis 40 %

Potato Diggers.—W. C. & Co., reduced list..dis 50 %

Pulleys.—Acme or Excelsior, 1¼ in.....₩ doz 24c
Acme or Excelsior, 2 in.....₩ doz 27c

Pulley Blocks.....dis 35 %

Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 40 %
Iron Pitcher Spout.....dis 45 %
Copper.....dis 30 %

Rivets.—Black (new list).....dis 45 %
Carriage in 10 lb papers (new list).....dis 45 %
Copper.....dis 33⅓ %

Razors.—Torrey's.....dis 25 %

Razor Strops.—Torrey's.....Full line

Rules.—Stanley, Boxwood.....dis 70 &10 %
Stanley, Ivory.....dis 55&10 %

Sad Irons.—Common.....₩ lb 3½c
Laundry.....₩ lb 6½c
Tailors' Geese.....₩ lb 6 c
Enterprise, "Potts".....dis 35 %

Sash Locks.—King & Hutchinson's, new list..dis 40 %

Sandpaper.—Baeder & Adamson.....dis 30 %
M. B. & D.....dis 25&5 %

Sash Weights.—Patent Eye.....₩ lb 1½c

Saws.—Hand Saws, Disston's.....dis 20 %
Wheeler & Clemson.....dis 20 %
Cross-Cut saws.
W. M. & Co., Common Tooth, No. 1.....₩ foot 35c
W. M. & Co., Champion Tooth.....₩ foot 55c
Disston's, Common Tooth.....₩ foot 60c dis 40 %
Disston's Great American Tooth...₩ foot 65c dis 40 %
Boynton's Light Ing Tooth.....₩ foot 45c
M. B. & D., Hand Saws.....dis 33⅓ %
W. M. & Co.'s Circular Saws.....dis 35 %
Richardson Bros.....dis 25 %

Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 10 %
Welch & Griffith, Extra.....₩ doz $8.40
Welch & Griffith, No 2.....₩ doz 7.00

Scales.—Fairbanks.....dis 20 %

Screws.—Aiken's Flat-Head Iron new list, dis 40 & 10 %
American Flat-Head Iron.....new list, dis 50 & 10 %
American Flat-Head Brass.....new list, dis 50 & 10 %
American Round-Head Brass.....new list, dis 40 & 10 %
American Round-Head Iron.....new list, dis 45 & 10 %
Griffiev Round Head Nickel-Plated Common..dis 50 %

Scythes.—Clippers, in boxes.....₩ doz $9.00

Shaves.—Kimball's.....₩ inch 7½c
Watrous.....dis 15 %

Shears.—American Shear Co., new list.....dis 70 %

Shot.—Tatham's.....₩ lb 7c

Shovels.—O. Ames, new list.....dis 15 %
O. Ames, other brands, new list.....dis 15 %
M. B. & D.....dis 15 %
Oxford, Birmingham Pattern.....dis 40 %

Sinks.—Magee Patent.....dis 30 %

Snow Shovels.....$4.00

Skates.—Union.....dis 25 %
Acme.....dis 25 %
Imperial Club list No. 5, $3.75 ₩ pair; list No. 7, $5.00 ₩ pair.....dis 25%

Stocks and Dies.—King's.....dis 10&5 %

Tacks.
Swedes Tinned.....dis 30&10 %
Swedes Iron.....dis 30 & 10 %
Gimp and Lace.....dis 20 & 10 %
Copper Tacks.....dis 30 & 10 %
All balances on list.....dis 20&10 %

Traps.—Oneida, Genuine.....dis 33⅓ %
Oneida, Imitation, H. & N.....dis 50 %
Blake's.....dis 40&10 %

Vises.—Simpson's Adjustable.....dis 25&5 %
Howard Vise Co.....dis 25 %
Prentiss'.....dis 20 %

Weather Strips.—Packer's.....₩ doz $4.50
Browne's Flexible Rubber.....dis 50 %
In 25 feet boxes: No. 1, ⅛ in. wide, ₩ yard, 10c.; No. 2, ¼ in., 15c.; No. 3, ¾ in., 20c.; No. 4, 1 in.....$4.00
Black Walnut Spring Weather Strips.....₩ doz $3.50

Window Springs.....d'33⅓ %
Babcock's No. 3.....₩ gross $0.25
Babcock's No. 4.....₩ gross 4.15

Wire Cloth.—"Clinton".....₩ ft

Wire Fence.—Scutt's Patent, Painted.....₩ lb 8c
Scutt's Patent, Galvanized.....₩ lb 9½c

Wire Goods.—Gate Hooks and Eyes, &c., new list.....dis 55&10 %

Wrenches.—A. G. Coe's.....dis 50 %
Girard Mfg. Co.....dis 50 & 10 %
Girard Agt.....dis 50 & 10 %

Wringers.—
Novelty No 2 for Common Tubs.....₩ doz 42.00
Novelty " 3 " " " .....₩ doz 48.00
Excelsior E " Stationary Tubs.....₩ doz 51.00
Excelsior F " " " .....₩ doz 57.00
Excelsior A with Folding Bench.....₩ doz 59.00
Excelsior B " " " .....₩ doz 63.00
$3.00 per doz dis if ordered in not less than 1 doz lots, and $6 per doz dis if ordered in not less than 5 doz lots.
Novelty Set Tub, E.....₩ doz 50.00
Keystone, Wood Frame No 1½.....₩ doz 30.00
Keystone, Iron Frame No 2½.....₩ doz 37.00
Zinc.....₩ lb 7½c

Withington, Cooley & Co.—Hoes, Rakes, Forks, &c. dis 10% Special rates for export.

McNab & Harlin Mfg. Co.,

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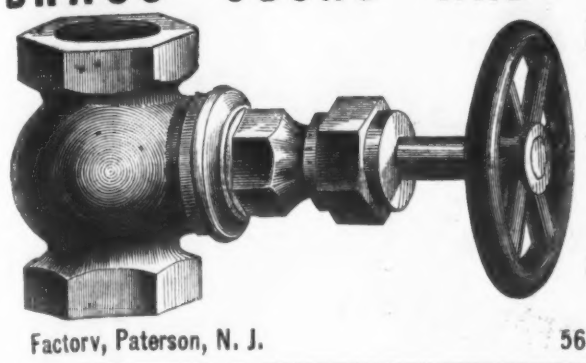
BRASS COCKS AND VALVES,



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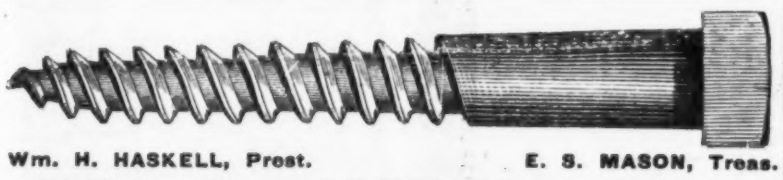

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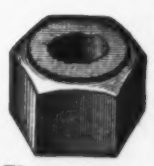

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Carriage & Tire Bolts. Star Axle Clips, &c

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METALINE

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Improved Sleeve Roller Bush Tackle Blocks.

Try Us with a Sample Order.

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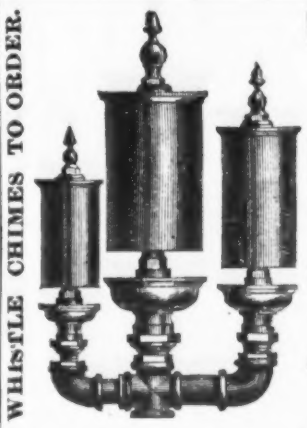
New York Warehouse, 33 South Street.

Clasp opened.

Clasp closed.

IMPROVED SNATCH BLOCK.

WHISTLE CHIMES TO ORDER.



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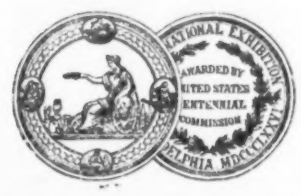
DEANE'S PATENT SOLID STOCKS AND DIES

LIGHTNING HAY KNIVES.

WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and is giving *universal* satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for exports as well as home trade, and it *seems destined* to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land or water to any part of the world.

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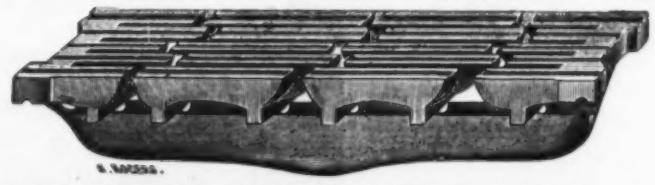
For sale by the Hardware Trade generally

W. C. WREN'S PATENT GRATE BAR.



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Also FIRE HYDRANTS.

Terry's Wrought Iron BARN DOOR HANGER & RAIL.

UNQUESTIONABLY The Best Hanger & Rail In the Market,

Will not break; cannot get off the track; snow, ice, or chaff cannot lodge on the Rail; will not warp or decay.

Write for Circulars.

Improved over Last Year!

OUR NEW JOINT,

With Dovetail Lap, as here shown, we guarantee to hold

1000 Pounds Weight,

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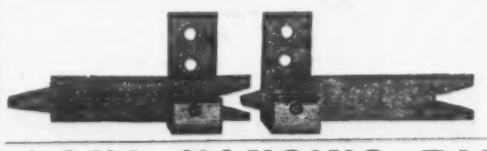

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FIFTY-SIX INCHES WITHOUT A SEAM.

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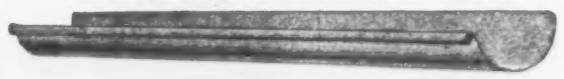

7 inch. 5 inch. 4 inch.

Over 200,000 Feet Sold in 1881.

It is made from best quality I. C. Leaded Charcoal Plates formed in half circle and beaded on the side with ⅜ inch round bead, closed down to body of trough, so that it can be soldered as strength may require. Our different sizes measure full across diameter, and we pack in uniform crates or boxes of 52 feet each, ready to be put together in any desired length. We make three sizes, suitable for any building, and can ship promptly on receipt of order. Address,

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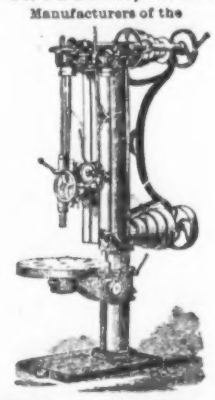

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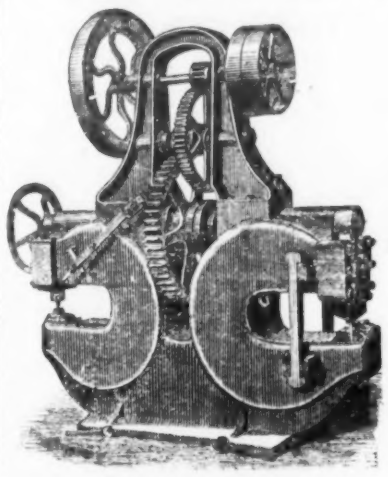

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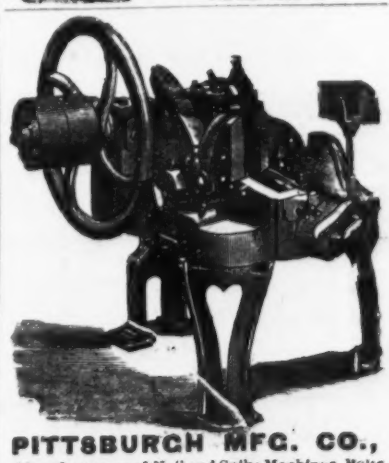

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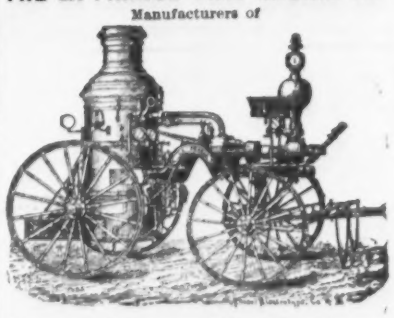

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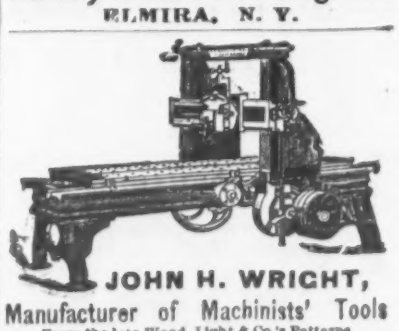

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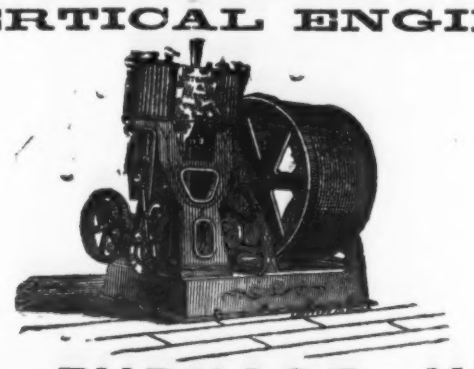

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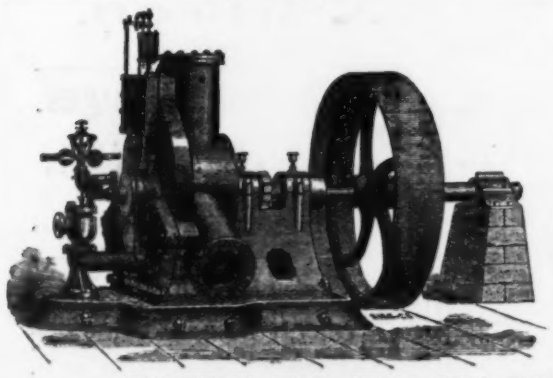

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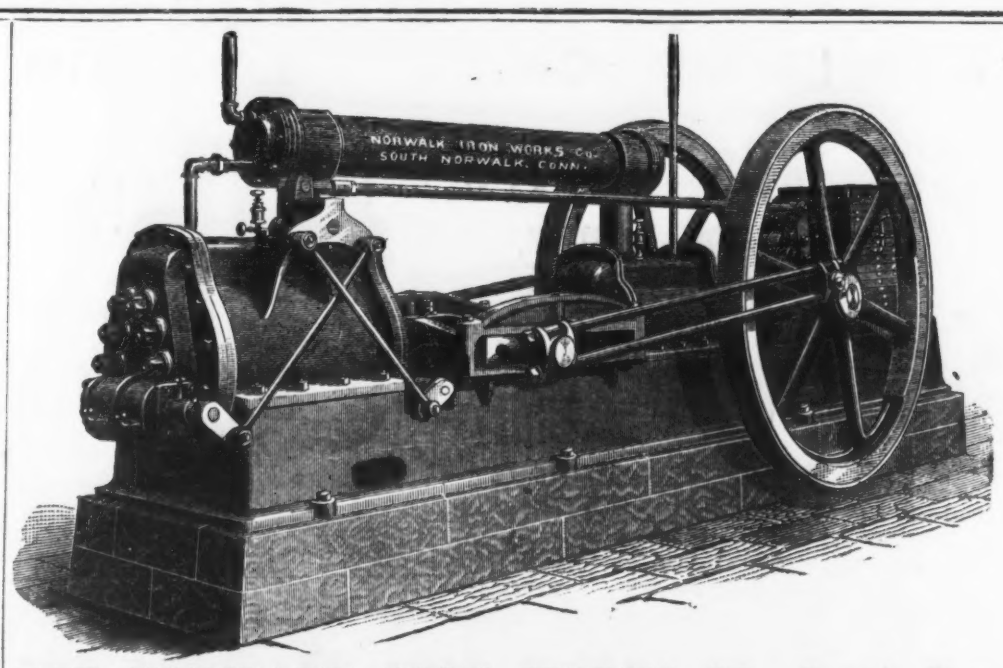

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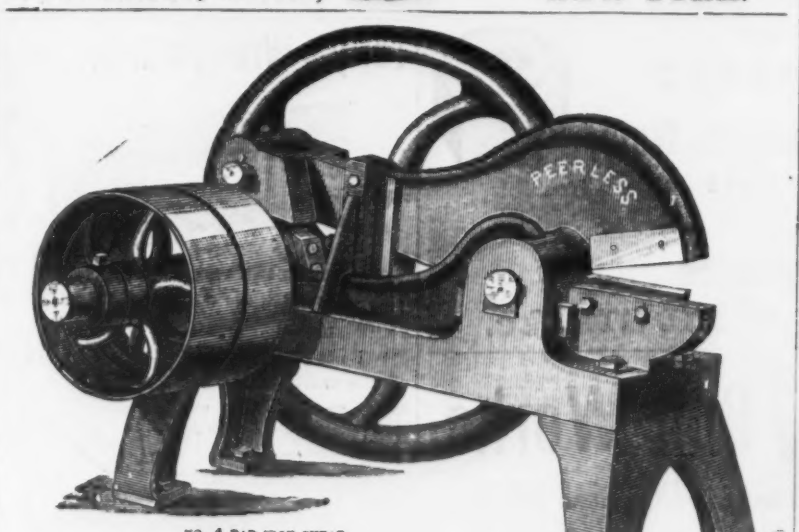

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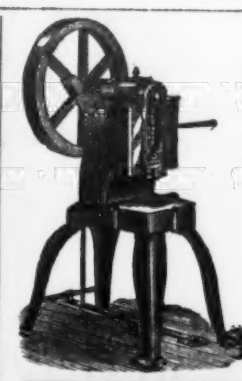

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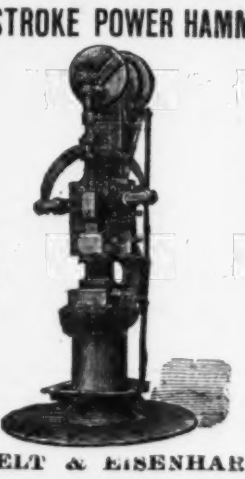

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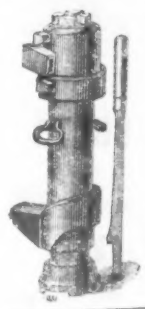

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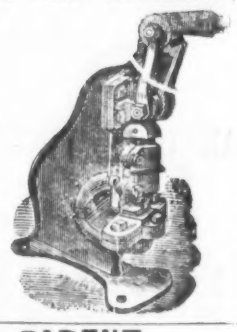

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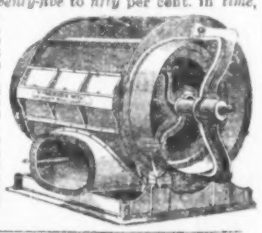

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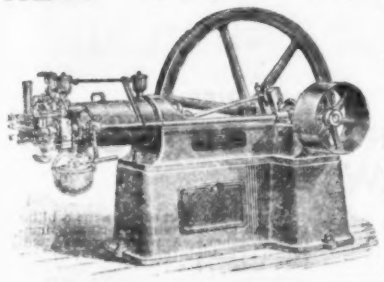

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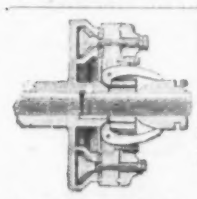

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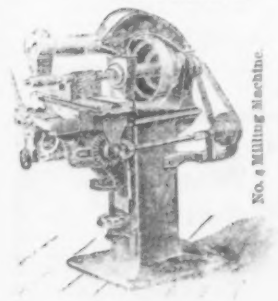

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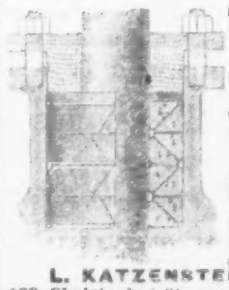

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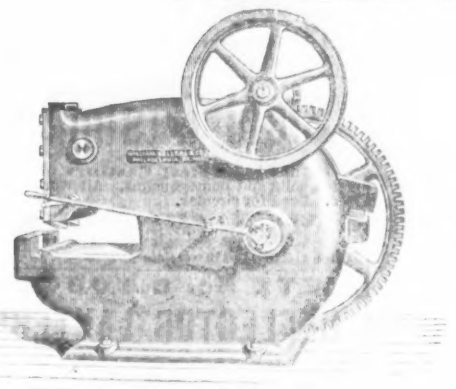

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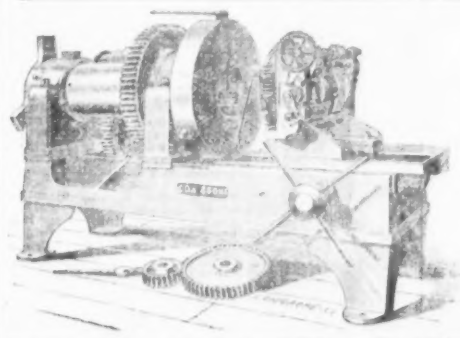

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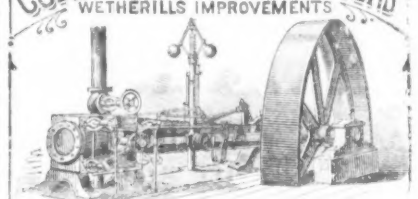

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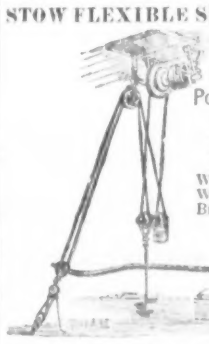

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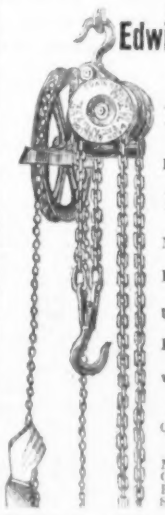

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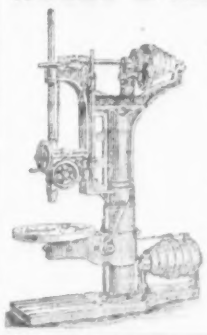

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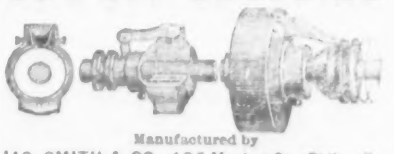

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